ENHANCING CAPACITY FOR LOW EMISSION DEVELOPMENT STRATEGIES/EC-LEDS

CLEAN ENERGY PROGRAM

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Knowledge, Attitude and Behaviour Baseline Survey

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ENHANCING CAPACITY FOR LOW EMISSION DEVELOPMENT STRATEGIES/EC-LEDS CLEAN ENERGY PROGRAM

Knowledge, Attitude and Behavior Baseline Survey

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TABLE OF CONTENTS

List of Figures

List of Tables

ACRONYMS

ACT	Analysis and Consulting Team
CBSM	Community based Social Marketing Campaign
EC-LEDS	Enhancing Capacity for Low Emission Development Strategies
EE	Energy efficiency
F2F	Face to face
GB	Green buildings
GOG	Government of Georgia
KAP	Knowledge, Attitude and Practice
LPG	Liquefied petroleum gas
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

Winrock International, in the frame of the USAID Georgia Enhancing Capacity for Low Emission Development Strategies (EC-LEDS) Clean Energy Program, received a cooperative agreement (grant) to implement the EC-LEDS Clean Energy Program for Georgia. The program supports increased climate change mitigation by building municipal capacity in climate change mitigation measures and raising public awareness; increasing private sector investment in energy efficiency and green buildings; and strengthening the Government of Georgia's capacity to develop and implement a national Low Emission Development Strategy.

Before launching the project, a baseline survey was conducted in order to obtain baseline information on project indicators. In the final year of the program, a follow-up survey will be executed in order to enable a comparative analysis of baseline and end of program data, and an overall evaluation of project activities, in particular the outreach program and its anticipated results.

The baseline survey is being implemented in two phases: (1) the quantitative baseline survey, to collect information related to outreach related indicators.

2) Based on the initial survey, two municipalities will be selected for the Community-Based Social Marketing (CBSM) pilot. Focus groups will determine the barriers and benefits of adopting behaviors related to target mitigation actions for target municipalities. The results of the focus groups will inform a second quantitative survey for the CBSM.

The first phase quantitative survey is a Knowledge, Attitudes and Behavior (KAB) study aiming to gain baseline information on energy consumption practices and knowledge and attitudes toward energy efficiency measures. The survey methodology was designed in order to obtain statistically reliable information nationwide as well as for the following municipalities: Batumi, Kutaisi, Gori, Tbilisi, Poti, Rustavi, Zugdidi, Zestafoni, Akhaltsikhe, and Telavi. A total sample of 4380 face-to-face interviews were allocated, enabling a three percent error margin nationwide and a five percent error margin for target municipalities; As for the Tbilisi-urban-rural distribution, which was also applied to the analysis, for urban population error margin makes 5.4 percent, while for rural population error margin is 4.2 percent.

DWELLING AND HOUSEHOLD CONDITIONS: For urban residents it is more typical to live in apartment houses built with concrete slabs and brick, while rural residents live predominantly in private homes built with block and stone. In general, most of the homes were built before the year 1990. Also, the share of new apartments is somewhat higher in Tbilisi. The practice of making major repairs such as roofing, and switching to more energy efficient windows is more common among urban and especially Tbilisi residents, while a great majority of rural residents have never made any major repairs to their homes since they were built. Although rural households are larger in size, they have even larger living space when compared to urban residents.

GENERAL ENERGY CONSUMPTION AND EXPENSES: Electricity and natural gas are the main energy sources used for different purposes in the whole country, but while electricity is used by almost every household, the use of natural gas is 60 percent nationwide and it

varies across localities. In general, natural gas consumption practices are determined by two main factors: (1) urban/rural location and (2) accessibility of energy sources. The survey reveals that the accessibility of natural gas depends mainly on urban/rural location. Even though some urban areas have limited access to natural gas, in almost every municipality, access to natural gas among rural residents is lower when compared to urban residents from the same municipalities. Poti and Zugdidi appeared to have the least access to natural gas. As for the rural areas specifically, again Zugdidi and Akhaltsikhe villages have almost no access to centralized piped gas delivery. In Telavi municipality, urban as well as rural areas appeared to have the best access to natural gas. Rural residents mitigate the lack of access to natural gas with the use of wood and bottled gas according to season. Although energy consumption varies widely by seasons, expenses for the main energy sources are extremely high among Tbilisi residents, which can be attributed to higher electricity tariffs in the capital and higher natural gas consumption (average annual expense on electricity and natural gas: Tbilisi – GEL 1163; outside Tbilisi urban areas – GEL 661; rural areas – GEL 445). On the other hand, outside Tbilisi urban areas and especially in rural areas, there is much higher wood consumption.

DWELLING AND WATER HEATING: The most common way to heat the dwelling is to use an individual heater in each room connected to either natural gas or electricity, or to use a wood stove. Almost every household with access to natural gas uses it as the main energy source for heating; that way an absolute majority of Tbilisi households use natural gas as a main energy source for heating, while on the contrary, rural residents heat houses mainly with wood stoves. Outside Tbilisi urban areas, natural gas and wood are consumed with the same share depending on access to natural gas. Wood consumption results in a smaller part of heated living space in the house. The availability of hot water from the tap is widely linked to access to natural gas – due to the lack of access to natural gas, a majority of rural households do not have hot water from the tap at all. Again, natural gas is the primary energy source for water heating for households with access. Those without access use electric water heaters. For Tbilisi residents, who have unlimited access to centralized energy sources, price is the main factor when deciding which energy source to use for heating and hot water production. Cost is important for other regions too, but due to problems related to energy accessibility, namely the limited connection to natural gas, there is less choice and in many cases people must use a fuel source that is accessible.

COOKING HABITS: Cooking strategies vary significantly by urban and rural communities in line with natural gas accessibility. For urban area residents and especially for households in Tbilisi, the main cooking means is a gas stove, while a wood stove is the most frequently used cooking appliance for rural households. Wood stoves are used for two purposes: heating and cooking. For the cold season, wood is the main source used for cooking while during summertime this is replaced by bottled gas.

LIGHTING: An absolute majority of households nationwide use electricity for lighting, and the traditional vintage light Edison bulbs are the main brand used, especially in rural areas. Energy saving bulbs are more widespread among Tbilisi residents, but the share of those using only EE lighting is only 15 percent – it is more common to use both types of bulbs, although even in Tbilisi a majority of households still use traditional bulbs. Electricity consumption for lighting purposes increases from rural to urban and Tbilisi households, as

the number of light bulbs per average household is higher in Tbilisi when compared to other locations.

HOME APPLIANCES: A TV set and refrigerator have the highest penetration rate, although almost every fourth rural household doesn't have a refrigerator. A TV set is owned by an absolute majority of the population. Washing machine ownership is quite low in rural areas when compared to the cities, but it is noteworthy that more and more rural households are purchasing washing machines within the last years. Given that the water supply problem is solved in many locations, and people apply different coping strategies, washing machine usage will be increasing in rural areas. Air conditioners/ventilators are mainly possessed by urban households, and in this case Batumi has the highest rate which can be attributed to the climate and touristic requirements in the municipality.

TRANSPORTATION: Every fourth household has at least one vehicle, although the vehicle ownership rate is a bit higher among Tbilisi residents when compared to other regions. The absolute majority of vehicle owners own cars and the most frequent car brands are Mercedes, Opel, Ford and BMW. For Tbilisi residents, the main use of a car is to get to the workplace while rural residents use it to get to the market. Accordingly, inhabitants of cities drive mainly in urban areas while the trips of rural area residents fall proportionally into urban-rural drives. Petrol is the primary type of fuel but more car owners living in Tbilisi have switched to gas over the last years (32 percent of car owners in Tbilisi use gas, while the figure is 23 percent in rural areas). As for public transport, Marshutka is the most common transport means, even for Tbilisi residents who have better access to bus service and a Metro. Marshutkas are used more by residents who make several round trips per day and also, by those whose average distance per round trip is longer. In general, rural residents travel less frequently but they make longer trips per outing, considering that they mainly visit municipal centers or other regions.

WASTE MANAGEMENT: Survey results show that waste collection and disposal is quite well managed in Tbilisi and other cities, contrary to rural areas where municipal waste disposal service is hardly available and the most common way to deal with the waste is to burn it. A portion of respondents even report that they throw waste in a river or dump it in a hole. Recycling is something not known by the vast majority of the population, however rural residents report using organic waste to feed animals.

COST AND ENERGY EFFICEINCY MEASURES: Energy efficiency measures are not popular among the total population – all actions undertaken in this regard tend to be based on cost rather than energy efficiency In terms of housing conditions. Changing window frames with more energy efficient material in order to avoid cold air infiltration is the main action undertaken, mostly by Tbilisi residents, while the majority of rural households have never made any major improvements to their houses since the time of construction. As for energy efficiency in terms of ownership and use of home appliances, considering that a majority of households have purchased main home appliances within the last few years, they consider these appliances to be energy efficient. In general, people became accustomed to switching off electric appliances and light bulbs when not using them – a behavior that is motivated by cost. A majority of surveyed respondents express a general readiness to use or switch to more energy efficient technologies for heating and cooking, as well as other

household equipment, but the level of energy efficient behavior and practice is not common so far.

ATTITUDES TOWARD ENERGY EFFICEINCY: Survey results show a low level of awareness of the “energy efficiency” concept as well as energy efficiency measures, technology, and appliances that can provide cost savings and increase comfort. Everything people have heard about energy efficiency comes from unofficial sources such as word of mouth, although they report that they prefer to receive information via television or internet. In people’s minds, energy efficiency measures are more related to cost reduction rather than to environmental issues.

INTRODUCTION

The USAID Georgia Enhancing Capacity for Low Emission Development Strategies (EC-LEDS) Clean Energy Program is a four-year (October 2013 – September 2017) technical assistance and capacity building project focusing on three main activities: 1) Georgian Municipal Energy Efficiency (GeMunee); 2) Green Building Rating and Certification System; and 3) National LEDS Working Group and Advisory Assistance. Winrock International has received a cooperative agreement (grant) to implement the EC-LEDS Clean Energy Program for Georgia to support increased climate change mitigation by building municipal capacity in climate change mitigation measures and raising public awareness; increasing private sector investment in energy efficiency (EE) and green buildings (GB); and strengthening the capacity of the Government of Georgia (GOG) to develop and implement a national Low Emission Development Strategy.

A Low Emission Development Strategy (LEDS) is a framework to reduce greenhouse gas (GHG) emissions associated with growth in a country's economy, i.e. to promote a low emission development pathway. They are designed to simultaneously increase the growth of a country's economy while reducing associated emissions compared to a business-as-usual scenario. They are often called low carbon, low emission climate resilient or green growth strategies. The concept of LEDS emerged from the UN Climate Negotiations in Copenhagen in 2009, where LEDS was recognized as indispensable for sustainable development. In subsequent years, these negotiations encouraged developing countries to develop LEDS and the need for financial support and commitment to build capacity was affirmed. The US Government's EC-LEDS program is a whole government approach by USAID and the State Department to build capacity for developing and implementing LEDS that are based on existing climate change plans and are country-led. Approaches to LEDS vary around the world from a single plan to multiple plans and countries are at various stages of developing and implementing LEDS. Georgia is one of over 25 countries being assisted with LEDS by the USG under the EC-LEDS Initiative.

The Knowledge, Attitude and Behavior (KAB) Survey was conducted to collect baseline data on the EC-LEDS project performance indicators, in particular indicators related to the outreach program, as well as study the behavior of energy consumers (end users). The baseline data will be utilized to inform the preparation of Public Awareness and Outreach Campaigns as well as Community based Social Marketing Campaigns (CBSM) pilot.

The research project is planned and being implemented in two phases within the framework of EC-LEDS omnibus research:

First Phase
For the first phase, the quantitative baseline survey will collect data on information related to all objectives, including indicators for the outreach program, focused on Knowledge, Attitudes and Behaviors, as well as end-use data useful for implementing all components of the program.

Second Phase
During the second phase, information from the initial survey will be used to select two target municipalities for conducting the Community-Based Social Marketing (CBSM) pilot. Focus

groups will be conducted in the two selected municipalities to determine the barriers and benefits within the target groups of adopting select behaviors related to climate change mitigation, e.g. installing energy efficiency measures in buildings, using less polluting forms of transportation, reducing waste generation, reducing cutting of trees, etc.

The results of the focus groups will inform the second survey for the CBSM. Survey questions will be based on focus group findings, and will be designed to specifically determine the barriers and benefits associated with the behaviors chosen for the CBSM campaign and to verify the findings in the focus groups and determine the size of the CBSM target segments.

This document presents results on the First Phase Quantitative Survey.

SECTION ONE: THE FIRST PHASE QUANTITATIVE SURVEY METHODOLOGY

1.1 Goal and Objectives

The main goal of the first phase quantitative survey was to collect baseline data on project performance indicators as well as study the behavior of energy consumers (end users). Specific Survey objectives were:

- To collect and analyze baseline data on project performance indicators;
- To collect and analyze baseline data on 'End Users' (consumers) to be utilized as input for the preparation and modeling of Sustainable Energy Action Plans (SEAP) at the municipal level;
- To collect and analyze data to inform the preparation of a Public Awareness and Outreach Campaign;
- To collect and analyze data on the behavior of end users (consumers) in order to plan Community Based Social Marketing (CBSM) pilot campaigns.

1.2 Sampling Design

The baseline survey was implemented nationwide including ten designated municipalities: Batumi, Kutaisi, Gori, Tbilisi, Poti, Rustavi, Zugdidi, Zestafoni, Akhaltsikhe, and Telavi. Sample design has been elaborated in such a way to enable a three percent margin of error nationwide and a five percent margin of error for target municipalities. A total of 4380 interview respondents with oversample in target municipalities has been selected. Detailed sample allocation is presented in the table below:

Table 1 – Sample Allocation

Region	Main sample		Oversample For Target Cities		Total N
	N of Interviews In Urban Areas	N of Interviews In Rural Areas	Oversample	Urban + Rural	
Tbilisi	330	0	Tbilisi	50	380
Kakheti	20	90	Telavi	110	460
Shida Kartli	30	50	Gori	110	400
Kvemo Kartli	50	70	Rustavi	340	460
Samtskhe-Javakheti	20	40	Akhaltsikhe	190	440
Adjara	40	50	Batumi	360	450
Guria	10	30			40
Samegrelo-Zemo Svaneti	50	80	Poti	380	850
			Zugdidi	140	
Imereti, Racha-Lechkhumi and Kvemo Svaneti	90	120	Kutaisi	350	880
			Zestaponi	110	
Mtskheta-Mtianeti	10	20			30
Total Sample Size = 4390					

The target population of the survey was defined as adult citizens (18+) of Georgia residing in urban and rural areas.

Primary Sampling Units (PSU) are Census Districts. The PSUs were selected by probability proportional to size within relevant strata. The size of a PSU was measured according to the number of registered voters inside the PSU.

Secondary Sampling Units (SSU) are households within Census Districts. Households were selected via the systematic random walk principle.

Final Sampling Units (FSU) were individuals within households – the most informed person on survey objectives. If the desired eligible respondent was unavailable at the time of the interview (e.g., is busy or not at home), the Interviewer made two more call backs to contact the respondent (resulting in a total of three attempts).

1.3 Survey Technique and Instrument

The first phase quantitative survey used a face-to-face interview technique. The interview lasted 30-35 minutes and consisted mainly of close-ended questions. The quantitative survey instrument has been prepared by ACT based on the main survey questions provided by WINROCK International Georgia.

The initial version of the questionnaire was piloted in order to make sure that all questions are clear to respondents as well as interviewers and there are no technical inaccuracies in

the document. Pilot testing was completed in Tbilisi and in rural areas as well. Ten test interviews were conducted in the frame of the pilot survey.

The final survey instrument has been prepared and approved in English and later translated into Georgian and Russian languages for fieldwork implementation purposes.

1.4 Survey Fieldwork

Enumerators' Team and Training

Fieldwork in the frame of the EC-LEDS KAB Study was implemented by a professional team of enumerators from ACT in Tbilisi and in all regions of Georgia, including Russian speaking enumerators. A total of 70 enumerators were involved in the study.

Prior to fieldwork implementation, the ACT project team developed a training module and detailed manual for enumerators. Enumerators' training was conducted by the Project Manager and Field Manager in Tbilisi. During the trainings, enumerators learned in detail:

- The main objectives of the survey;
- The questionnaire;
- The sampling design and
- Detailed instructions in order to ensure that respondents understand the importance of participation and ensuring confidentiality.

Enumerators were provided with all materials needed for the fieldwork, such as:

- Route card;
- Incomplete interview form;
- Sampling guideline;
- Technical report form;
- Cards and questionnaires.

For the practical part of the training, simulated interviews were conducted; upon completion of simulated interviews a debriefing session was held to analyze typical mistakes and problems.

Fieldwork Implementation

The Fieldwork Manager prepared a detailed survey implementation plan for each region involved in the study based on the sample distribution. Survey fieldwork included the following phases:

- Field visit – interview;
- Delivery of survey materials to regional coordinators;
- Initial revision of completed questionnaires in the regions;

- Delivery of completed questionnaires, technical report forms and other field documents to the ACT Tbilisi office.

Regional coordinators were obliged to conduct an initial revision of the completed questionnaires at the local level and, in case of any inaccuracy, return them to the enumerators for repeated completion/improvement. Afterwards regional coordinators sent completed questionnaires to the ACT Tbilisi head office.

Field quality control was conducted according to ACT Quality Assurance Procedures by quality control team members in each of the target areas. The quality control process ran simultaneously to the fieldwork and applied the following measures to ensure a high quality of obtained data:

- Telephone control: 15 percent of conducted interviews were checked using a special mini questionnaire through telephone re-interviewing of the respondent.
- Visit to the respondent: two percent of submitted questionnaires were verified by visiting the respondent.
- In-office revision/logical control: In line with fieldwork and quality control activities, the questionnaire logical control (editing) process was applied to 100 percent of the questionnaires in order to identify any missing information or inaccuracies.

After the completion of the questionnaire revision process, all open-ended questions were coded and completed questionnaires were entered into the electronic database for further analysis.

1.5 Analysis of the Data

Survey data were entered into SPSS 16.0 software. A data cleaning process was applied in order to exclude inconsistencies from the data set prior to addressing statistical analysis.

SPSS package was used for data weighting and statistical analysis.

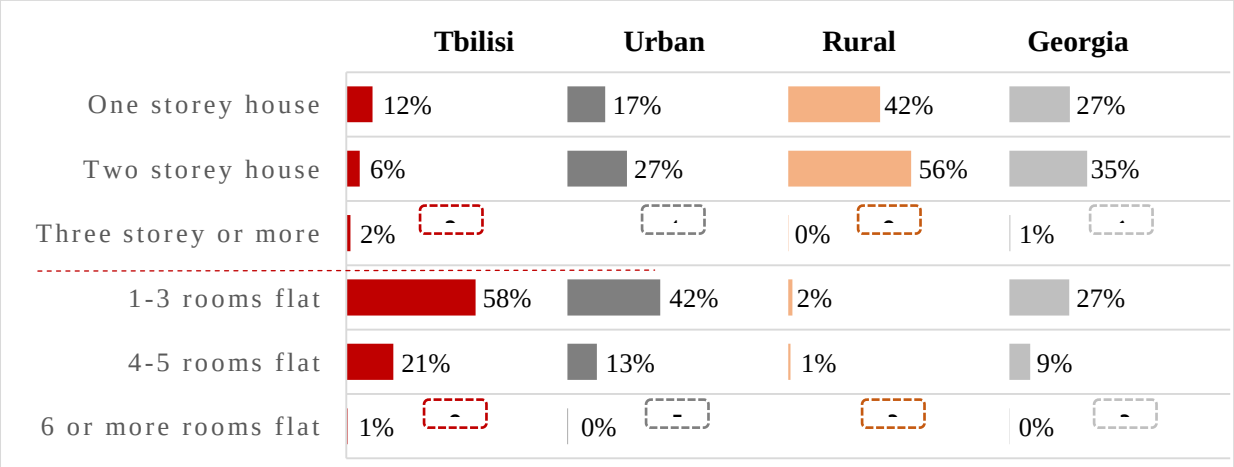
SECTION TWO: THE FIRST PHASE QUANTITATIVE SURVEY RESULTS

2.1 Dwelling and Household Conditions

The types of homes survey respondents inhabit differ significantly by area: a majority of the population from Tbilisi and other urban areas lives in apartment buildings while private homes are predominant in rural areas. Among urban households, one to three room apartments are most common while more than half of rural households live in two-storey private houses.

Compared to Tbilisi, the share of households living in private homes is higher in other urban areas.

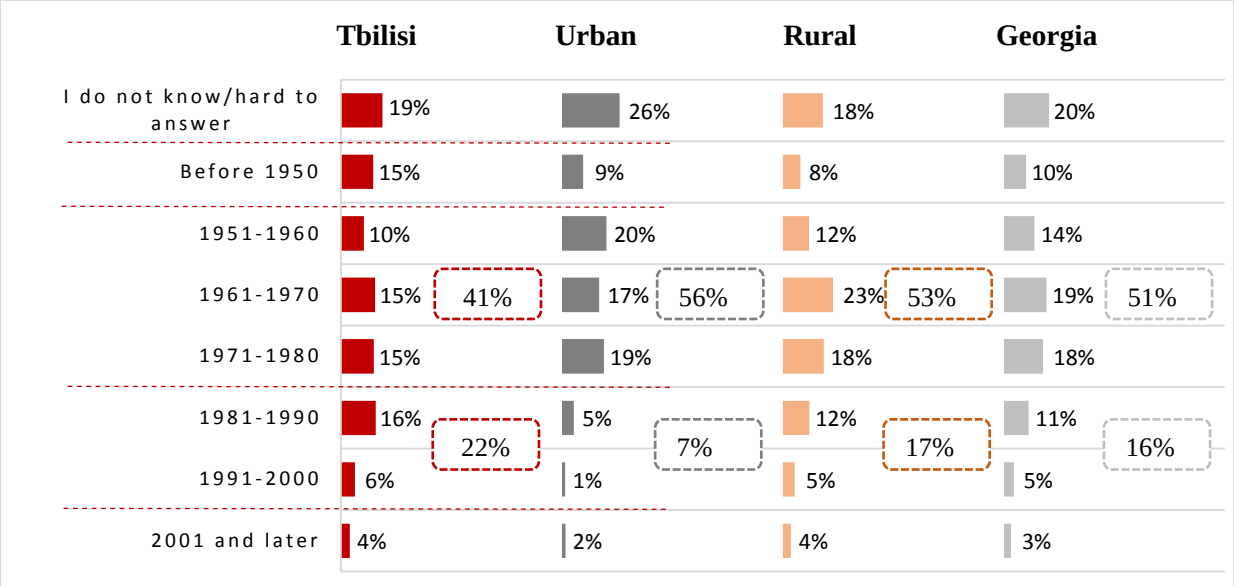
Figure 1: Type of a dwelling



Sample size = 1200

About half of the population across the country lives in houses built between the years of 1951 and 1980. The share of houses built later (after 1981) in general is smaller but still higher in Tbilisi when compared to other regions.

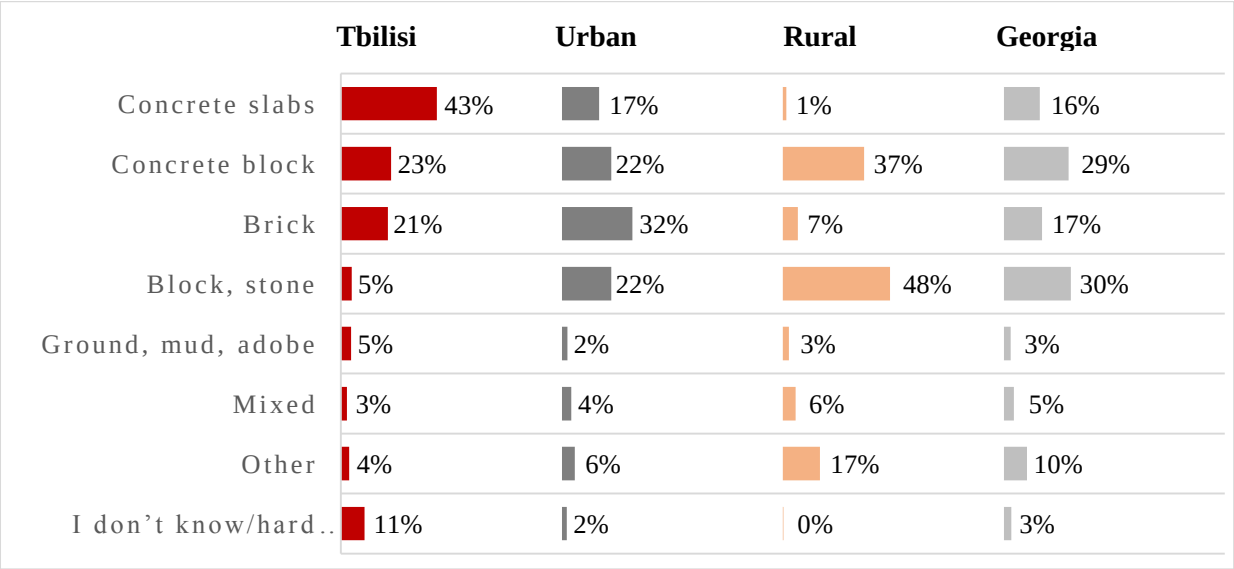
Figure 2–Time when the dwelling was built



Sample size = 1200

Concrete slabs, concrete blocks, bricks and blocks/stones are the most common building materials used, but the picture varies significantly across areas. In urban areas except Tbilisi, all mentioned materials are more or less spread, while concrete slabs are mostly used in Tbilisi and buildings in rural areas are mainly of blocks/stones.

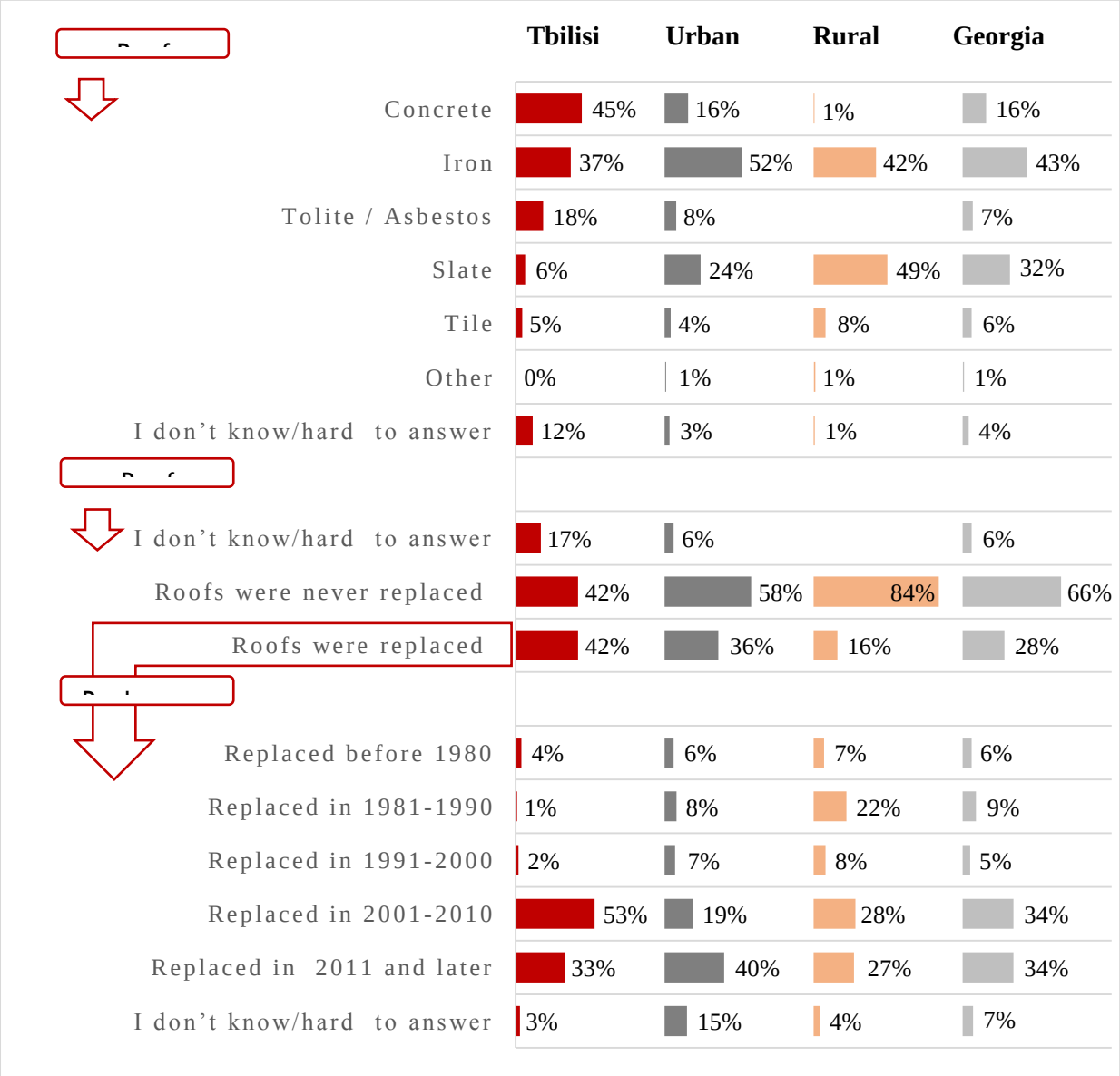
Figure 3 – Building material used for external walls



Sample size = 1200

Roof materials vary across capital, urban and rural areas. In Tbilisi, concrete is the most widespread roof material followed by iron, which is the main roof material in other urban areas. In rural areas, slate and iron are the most common roof materials. Roof replacement is not widely practiced, as the majority of household representatives state that the roof was never replaced. However, in Tbilisi the share of those remembering that the roof of the house or apartment was replaced is much higher than in other areas, especially rural. Roof replacements were made mainly after the year 2000.

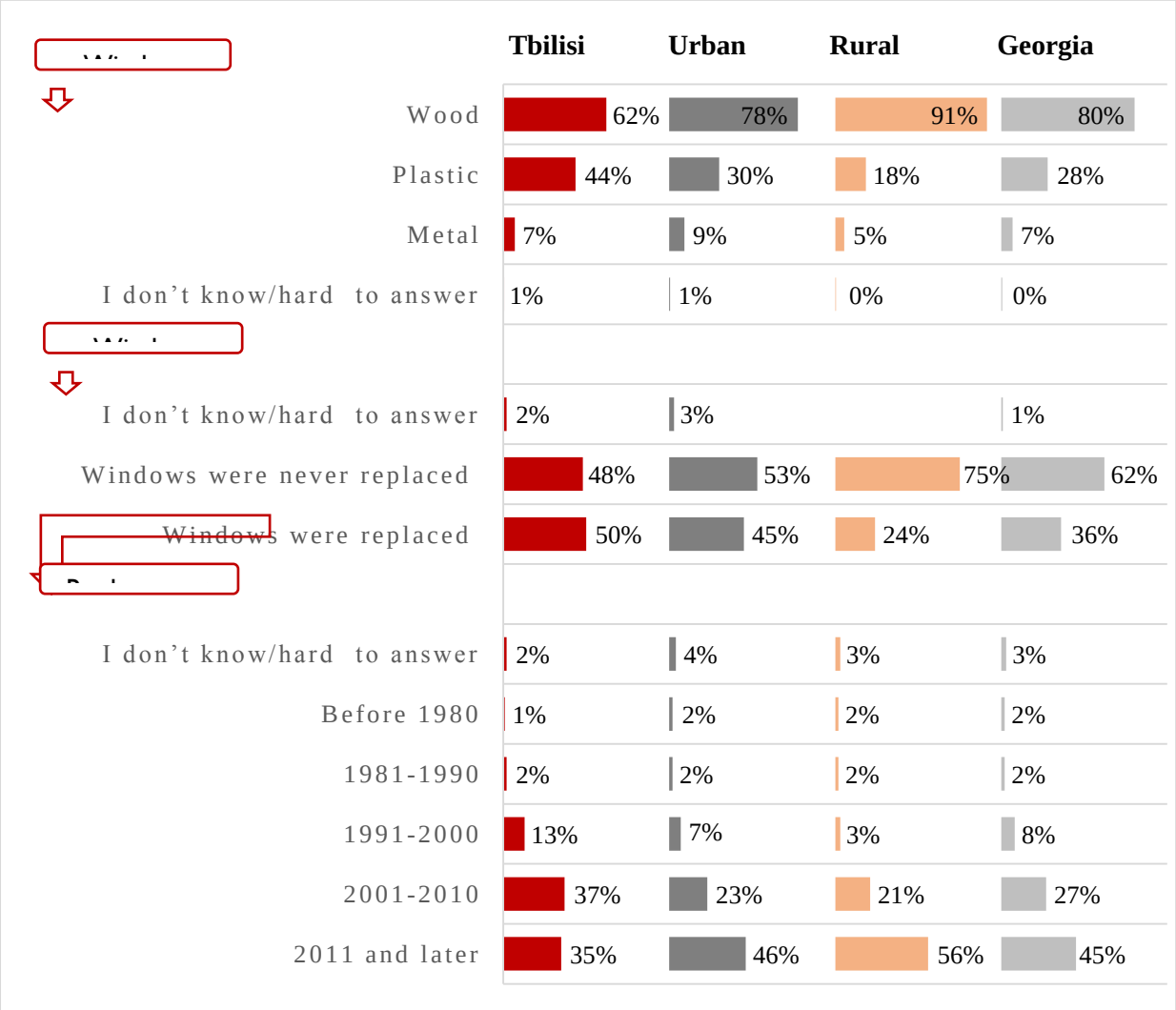
Figure 4 – Roof materials and maintenance



Sample size = 1200

Window frames are manly wooden, but in urban areas and especially in Tbilisi more and more houses have plastic window frames. This result can be linked with the fact that about half of urban households have replaced window frames in the last decades.

Figure 5 – Window frame material and maintenance



Sample size = 1200

The average living space of households on the national level is 100 square meters, but the figure is lower in Tbilisi when compared to other urban areas and especially compared to rural areas. The same applies to non-living area, which is larger in rural communities than in urban areas.

As for the number of the different types of rooms/spaces, detailed information by survey target area is presented in Table 2.

Table 2 – Area of living and non-living space

Living and non-living areas of the households	Tbilisi	Urban area	Rural area	Georgia
Area of the living space in a dwelling	78.55	87.06	120.72	100.82
Area of the non-living space in a dwelling (garage, attic, marani, basement, etc.)	8.77	21.45	40.38	27.29

Sample size = 1200

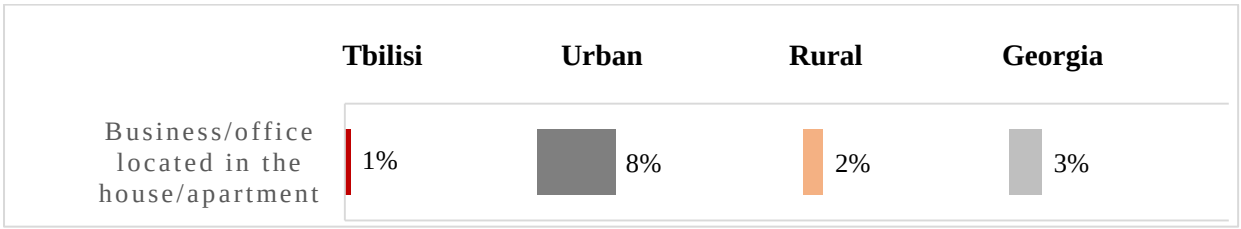
Table 3 – Types of rooms in the dwelling and their average number

Room type	Tbilisi		Urban area		Rural area		Georgia	
	%	Ave N	%	Ave N	%	Ave N	%	Ave N
Living rooms	98%	1.04	97%	1.13	98%	1.16	98%	1.12
Dining rooms	23%	1.03	55%	1	66%	1.05	52%	1.03
Bed rooms	96%	1.88	93%	2.21	98%	2.66	96%	2.35
Kitchen	97%	1	93%	1.02	86%	1	91%	1.01
Toilet and Bathroom	98%	1.18	92%	1.04	73%	1.08	85%	1.1
Loggia	48%	1.05	34%	1.02	19%	1.05	30%	1.04

Sample size = 1200

The survey shows that few households use the buildings they inhabit for commercial purposes. Although the figure is quite small in all areas, dwellings are less used for business purposes by Tbilisi residents.

Figure 6 – Use of dwelling space for business activities



Sample size = 1200

DWELLING AND HOUSEHOLD CONDITIONS BY TARGET MUNICIPALITIES

A comparison of study results of target municipalities shows that the share of households living in apartments is higher in Rustavi, while inhabiting private houses is the most common practice in Zugdidi and Akhaltsikhe towns.

Table 4 – Type of a dwelling

Municipalities		Houses	Apartments
Tbilisi		17%	83%
Kutaisi		21%	79%
Batumi		28%	72%
Rustavi		8%	**92%**
Poti		61%	39%
Gori	Urban	52%	48%
	Rural	100%	0%
	TOTAL	84%	16%
Zugdidi	Urban	**86%**	14%
	Rural	97%	3%
	TOTAL	93%	7%
Zestafoni	Urban	33%	67%
	Rural	100%	0%
	TOTAL	77%	23%
Akhaltsikhe	Urban	**72%**	28%
	Rural	**100%**	0%
	TOTAL	86%	14%
Telavi	Urban	**68%**	33%
	Rural	**100%**	0%
	TOTAL	90%	10%

Sample size = 3800

A municipal breakdown of the data shows that the share of houses built between 1981 and 1990 is higher in Kutaisi, Rustavi and Poti cites when compared to urban areas of the other target municipalities. The data from urban areas of target municipalities also reveals that the share of houses built before 1981 is the highest in Gori. As for rural areas, more houses are built before 1981 in Telavi villages.

Table 5 – Time when the dwelling was built

Municipalities		Before 1981 TOTAL	After 1981 TOTAL
Tbilisi		54%	26%
Kutaisi		50%	**30%**
Batumi		43%	21%
Rustavi		60%	25%
Poti		37%	28%
Gori	Urban	**72%**	2%
	Rural	73%	13%
	TOTAL	73%	9%
Zugdidi	Urban	31%	12%
	Rural	33%	13%
	TOTAL	33%	13%
Zestafoni	Urban	60%	15%
	Rural	65%	28%
	TOTAL	64%	24%
Akhaltsikhe	Urban	56%	18%
	Rural	70%	19%
	TOTAL	63%	19%
Telavi	Urban	65%	17%
	Rural	**81%**	8%
	TOTAL	77%	11%

Sample size = 3800

An analysis of data on the municipal level shows that brick is a more common building material in Kutaisi and Gori towns. Concrete slabs are more common in Rustavi, and concrete blocks in Zugdidi urban areas. Comparison of study results from rural areas of target municipalities shows that the majority of houses in Akhaltsikhe and Telavi are built from block and stone, while concrete block is the predominant building material in Zugdidi and Zestafoni villages.

The average living space of households is quite high in rural areas of target municipalities. The highest figure is shown in Gori, where the average living space is 168 square meters. There are no significant differences in non-living space by target municipalities except in Telavi rural areas where the average non-living space is 163 square meters. It is not strange considering that large wine houses (marani) are quite common in this region.

Table 6 – Area of the living and non-living space by municipalities

Municipalities		Living Space	Non-living space
Tbilisi		77	21
Kutaisi		71	20
Batumi		75	36
Rustavi		57	17
Poti		80	48
Gori	Urban	81	25
	Rural	**168**	34
Zugdidi	Urban	116	38
	Rural	111	37
Zestafoni	Urban	84	44
	Rural	**134**	44
Akhaltsikhe	Urban	99	33
	Rural	123	52
Telavi	Urban	110	45
	Rural	135	**163**

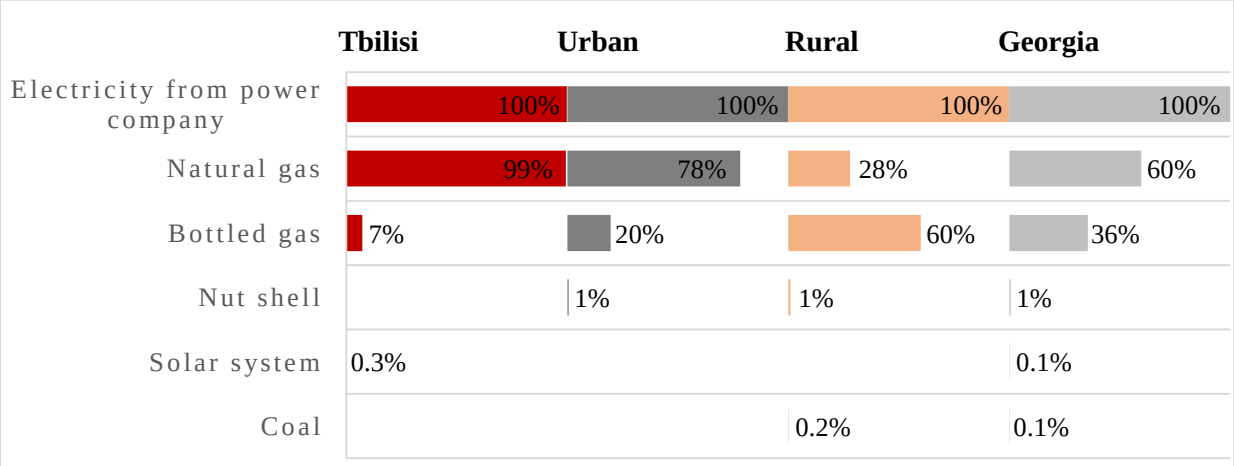
Sample size = 3800

2.2 Energy Consumption

2.2.1 Access to Energy Sources and Energy Consumption

An absolute majority of Georgia's population has access to centralized electricity from a power company. As for access to natural gas, the situation differs significantly across different areas. On the national level, 60 percent of households have access to natural gas pipes, but the figure on the rural level is dramatically low and comprises only 28 percent.

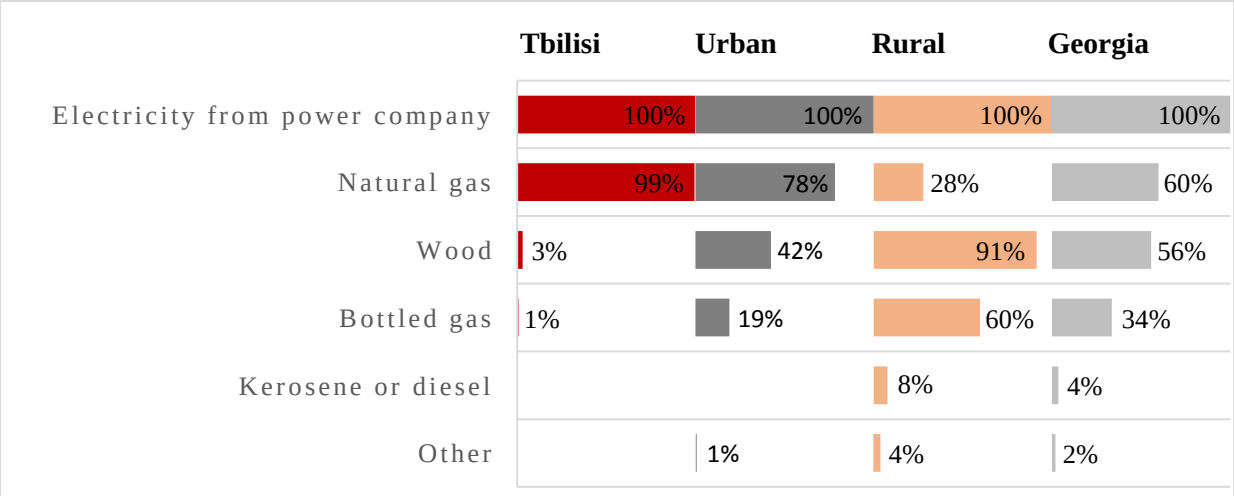
Figure 7 – Accessible energy sources



Sample size N=1200

Survey data on the usage of different energy sources coincides with the data on access to energy sources: everybody with access to either centralized electricity or piped gas uses it. Also, due to limited access to piped gas, for rural residents wood is the most consumed energy source, along with electricity.

Figure 8 – Used energy sources



Sample size = 1200

The highest monthly bills for electricity during both warm and cold seasons are observed among Tbilisi residents, which can be explained by a higher electricity tariff per capita resident. Monthly electricity bills for Tbilisi residents during the cold season are almost twice as high as monthly bills during the summertime; the same tendency is observed among

residents of other urban areas. Monthly electricity bills during the cold and the warm seasons don't differ for rural residents. Monthly bills for warm and cold seasons even more significantly vary for natural gas, especially among Tbilisi residents: if monthly gas bills during the warm season are about GEL 20, during cold seasons bills reach GEL 100 per month; the difference is much smaller among rural households.

Table 7 – Expenses for different energy sources

Energy Sources		Tbilisi	Urban	Rural	Georgia
Electricity bills in GEL	Monthly bills during summer – warm season	28.06	21.39	16.22	20.68
	Monthly bills during winter – cold season	44.08	30.85	16.17	27.38
	Annual bills	**475.03**	**256.67**	**200.28**	**285.93**
Natural gas bills in GEL	Monthly bills during summer – warm season	20.95	14.38	14.52	17.21
	Monthly bills during winter – cold season	95.18	64.28	30.27	70.55
	Annual bills	**688.02**	**404.65**	**245.13**	**494.27**
Bottled gas/LPG annual consumption in liters		**11.50**	**95.39**	**76.73**	**78.99**
Wood consumption	**Annual Consumption in M^3**	**7.00**	**7.17**	**7.82**	**7.70**
	Annual expensein GEL	**350.00**	**434.39**	**487.51**	**475.46**

Sample size = 1200

Table 8 – Expenses on natural gas and electricity by household size

Bills in GEL	Household size	Tbilisi	Urban	Rural
Annual bills for natural gas in GEL	1 member	307	277	241
	2 members	597	355	155
	3 members	649	355	210
	4 members	764	446	223
	5 members and more	794	495	299
Annual bills for electricity in GEL	1 member	349	150	151
	2 members	374	211	150
	3 members	492	257	201
	4 members	496	240	206
	5 members and more	529	341	228

Sample size = 1200

ACCESS TO ENERGY SOURCES AND ENERGY CONSUMPTION BY TARGET MUNICIPALITIES

An analysis of data at the municipal level reveals important deviations among different areas related to access to natural gas. As shown in the table below, access to natural gas is extremely low in Poti city (14 percent) and Zugdidi municipality (23 percent). For rural areas, households inhabiting Telavi municipality villages have better access to centralized natural gas (67 percent), while only two percent of the villages in Zugdidi municipalities access natural gas. No households in Akhaltsikhe municipality villages have access to natural gas.

Table 9 – Accessible energy sources on the municipal level

Municipalities		Electricity from power company	Natural gas	Bottled gas
Tbilisi		**100%**	**99%**	**6%**
Kutaisi		**100%**	**93%**	**3%**
Batumi		**100%**	**54%**	**47%**
Rustavi		**100%**	**100%**	**1%**
Poti		**100%**	**14%**	**85%**
Gori	Urban	100%	93%	5%
	Rural	100%	23%	73%
	TOTAL	**100%**	**47%**	**51%**
Zugdidi	Urban	100%	55%	31%
	Rural	100%	2%	74%
	TOTAL	**100%**	**23%**	**57%**
Zestafoni	Urban	99%	99%	8%
	Rural	100%	28%	63%
	TOTAL	**100%**	**52%**	**44%**
Akhaltsikhe	Urban	100%	63%	25%
	Rural	100%	-	69%
	TOTAL	**100%**	**32%**	**47%**
Telavi	Urban	100%	96%	5%
	Rural	100%	67%	33%
	TOTAL	**100%**	**75%**	**24%**

Sample size = 3800

The lowest wood consumption is observed in Tbilisi and Rustavi cities. A majority of households in municipalities with rural areas consume wood, although wood consumption is higher in the villages than in urban areas of the municipalities. Detailed data on general energy consumption in municipalities broken down by urban-rural areas is presented in the table below:

Table 10 – Used energy sources

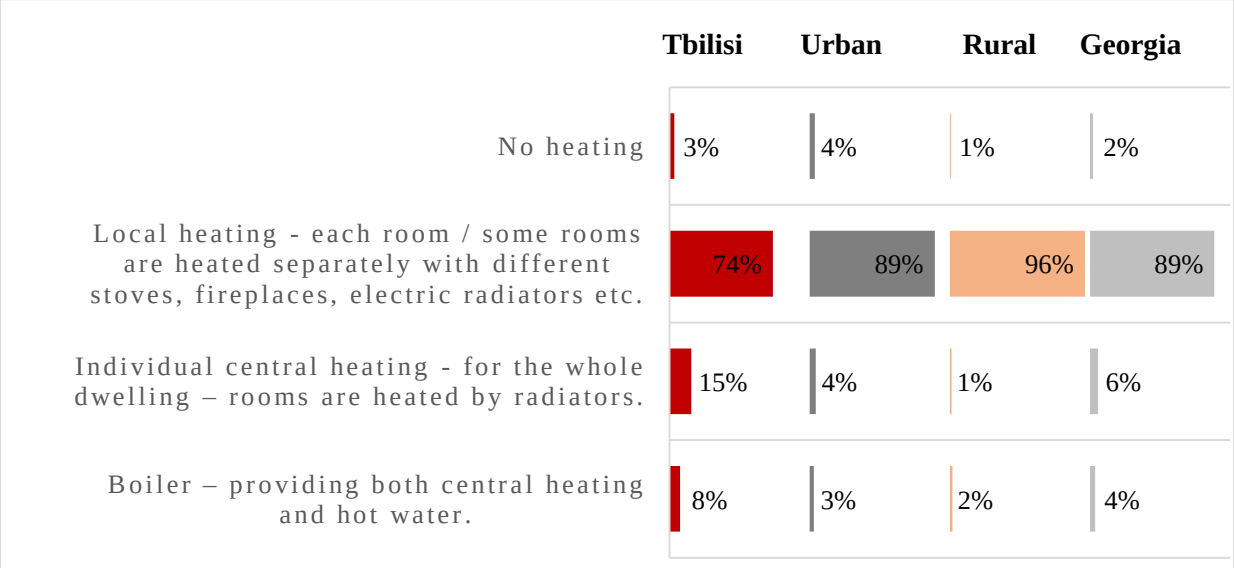
Municipalities		Electricity from power company	Natural gas	Bottled gas	Wood
Tbilisi		**100%**	**99%**	**1%**	**3%**
Kutaisi		**100%**	**93%**	**3%**	**12%**
Batumi		**100%**	**54%**	**47%**	**21%**
Rustavi		**100%**	**100%**	**1%**	**2%**
Poti		**100%**	**14%**	**85%**	**64%**
Gori	Urban	100%	93%	5%	41%
	Rural	100%	23%	73%	97%
	TOTAL	**100%**	**47%**	**51%**	**78%**
Zugdidi	Urban	100%	55%	31%	69%
	Rural	100%	2%	74%	91%
	TOTAL	**100%**	**23%**	**57%**	**83%**
Zestafoni	Urban	99%	99%	8%	25%
	Rural	100%	28%	63%	95%
	TOTAL	**100%**	**52%**	**44%**	**71%**
Akhaltsikhe	Urban	100%	63%	25%	67%
	Rural	100%	**0%**	69%	100%
	TOTAL	**100%**	**32%**	**47%**	**83%**
Telavi	Urban	100%	96%	4%	71%
	Rural	100%	67%	33%	98%
	TOTAL	**100%**	**75%**	**24%**	**90%**

Sample size = 3800

2.2.2 Heating

Two percent of the households across the country state that they do not have heating at all. The most widespread heating habit is to heat each room or some rooms separately with individual equipment. Central heating is accessible for a small portion of households, although the figure is much higher in the capital: 15 percent of Tbilisi households have individual central heating and eight percent have a unified system for heating and hot water.

Figure 9 – Used heating system



Sample size = 1200

Even though the majority of households state that they heat the dwelling, analysis of the data shows that living space is not fully heated. For example, households from Tbilisi heat on average 63 percent of the living space and the figure is much lower among rural households – they hit on average 33 percent of the living space (it should be noted that the average area of living space is also higher among rural households).

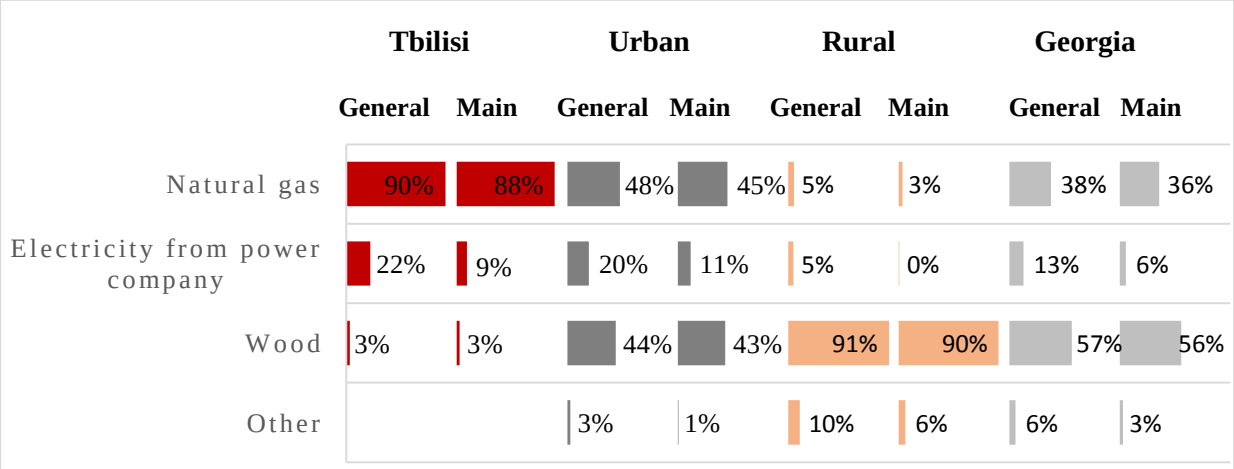
Table 11 – Heated part of the living space

Heated part of the living space	Tbilisi	Urban	Rural	Total
	63%	43%	33%	43%

Sample size = 1174

For Tbilisi households, natural gas is the main energy source used for heating purposes. The situation is totally different in rural areas, however, where households heat dwellings mainly with wood. In urban areas other than Tbilisi, almost the same share of both natural gas and wood are used for heating purposes.

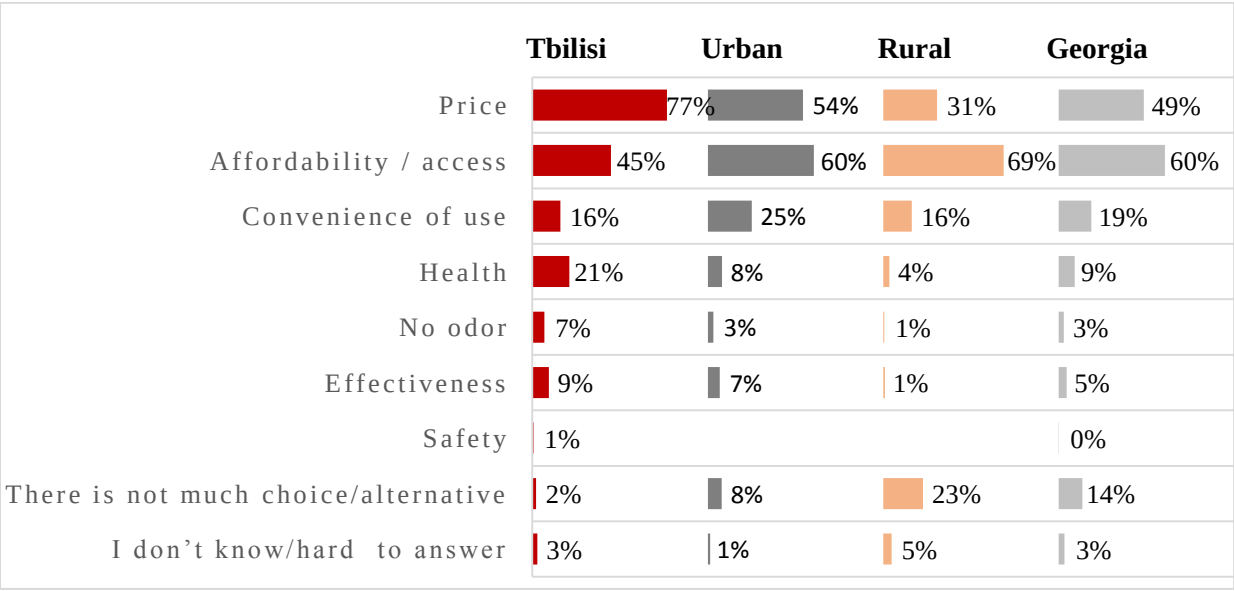
Figure 10 – Energy sources used for heating



Sample size = 1174

For Tbilisi residents, who have unlimited access to centralized energy sources, price is the main factor when deciding which energy to use for heating. The price is important for other regions too, due to problems related to energy accessibility, namely the limited connection to natural gas. A majority of the households outside the capital choose an energy source for heating based on accessibility. In addition, up to one-fourth of rural respondents state that there is no choice/alternative in terms of a heating energy source.

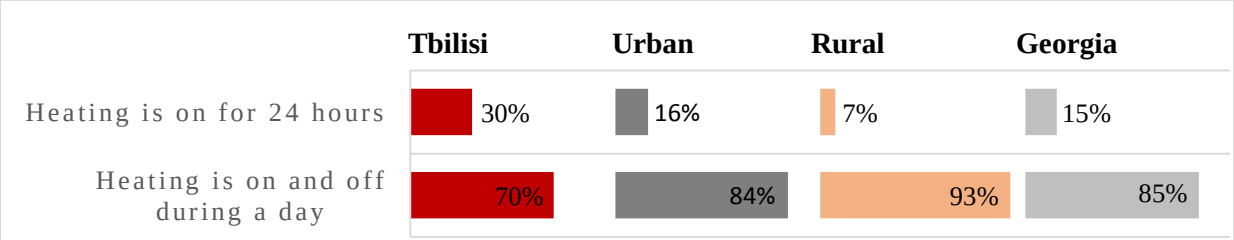
Figure 11 – Factors considered while deciding which fuel to use for heating



Sample size = 1174

A majority of the households in all target areas do switch heating on and off during the day. The share of households who have heating on all day long during the wintertime is higher in Tbilisi (30 percent), while in rural areas only a few households keep heating on for 24 hours. The average duration for heating is about nine hours a day among Tbilisi households, while the figure is higher for rural households – they keep heating on for about 11 hours.

Figure 12 – Heating habit



Sample size = 1174

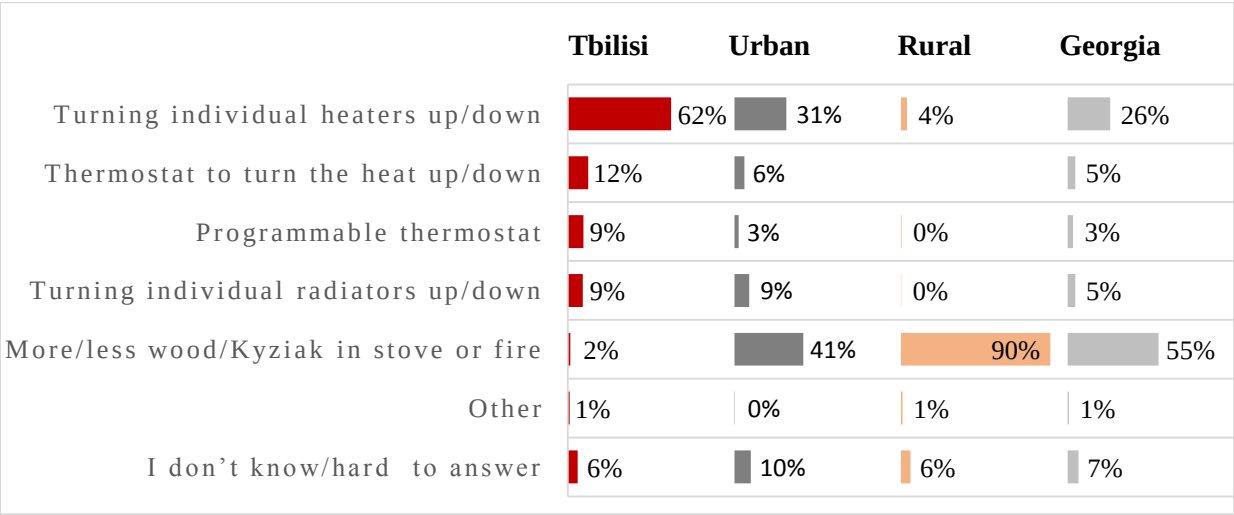
Table 12 – Average hours heating system is on

Average hours heating switched on	Tbilisi	Urban	Rural	Total
	8.63	9.31	11.37	10.26

Sample size = 1174

Considering that the major means of heating consists of individual heating equipment for separate rooms – stoves in case of natural gas and fireplaces in case of wood – in order to control the level of heating in the dwelling, individual heaters are up and down or more or less wood is used in the fireplace.

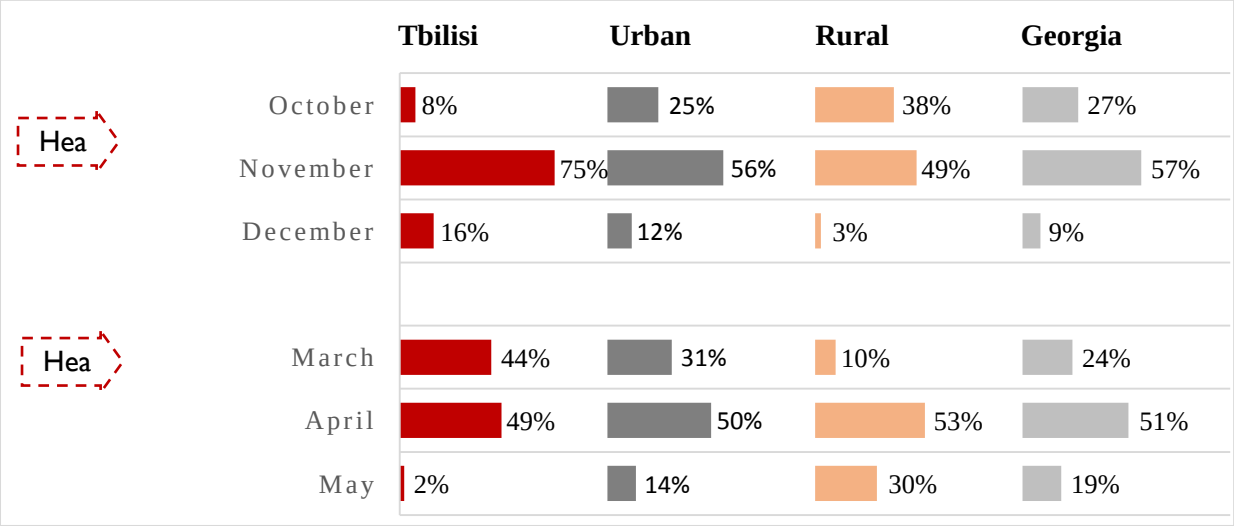
Figure 13 – Means to control the level of heating in a dwelling



Sample size = 1174

The duration of the heating season is longer in rural areas when compared to Tbilisi and other urban locations. If in urban areas households typically turn on heating in November and turn it off in March or April, more rural households start heating earlier in October and up to one-third of rural households still heat the dwelling until May. Accordingly, as shown in Table 9, the average number of months when the heating is on is higher for rural areas than in urban areas and especially compared to Tbilisi.

Figure 14 – Duration of heating season



Sample size = 1174

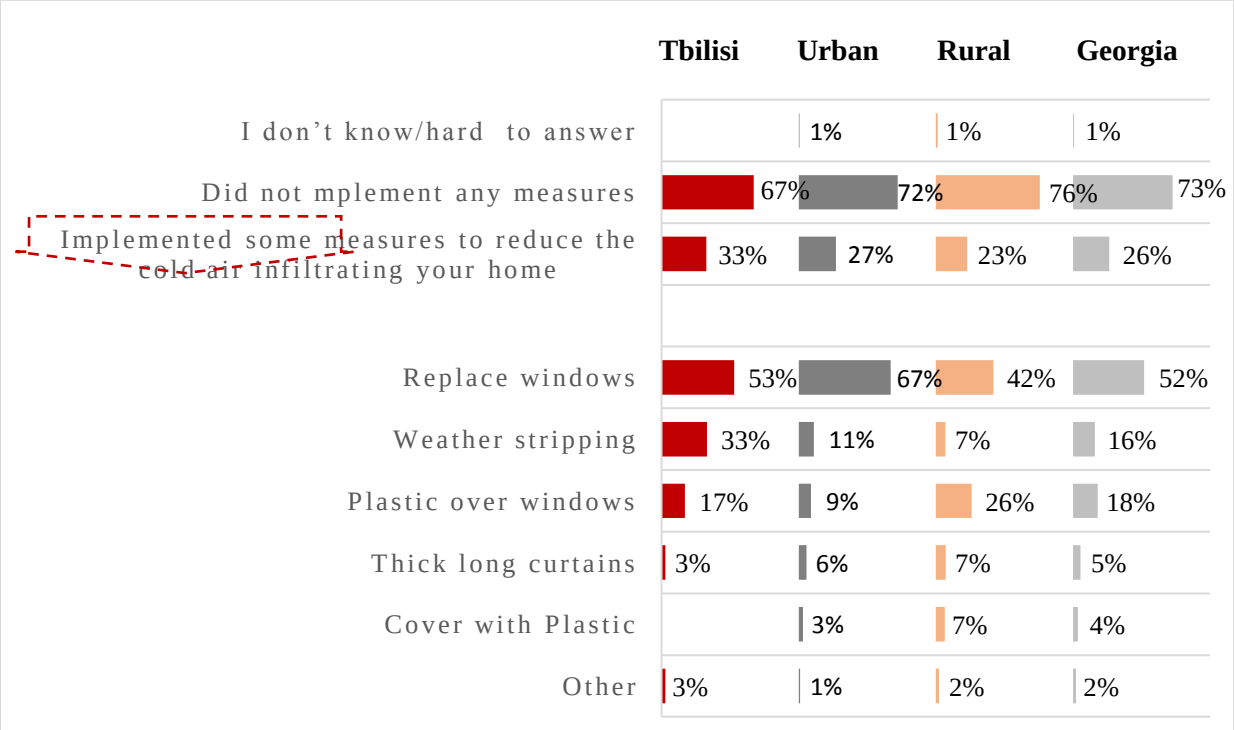
Table 13 – Average duration when the heating is on

Average number of months when the heating is on	Tbilisi	Urban	Rural	Total
	6.4	7.0	7.9	7.2

Sample size = 1174

Every fourth surveyed household states that they have implemented different measures to reduce cold air infiltration in the home. Behavior differs across survey target areas: more households in Tbilisi try to improve thermo isolation conditions and the main way for this is the replacement of window frames with more thermostatic materials and weather stripping. Replacement of window frames is the most common practice in all survey target areas, although more households in rural localities stick plastic over the window frames.

Figure 15 – Implementation of measures to reduce the cold air infiltration



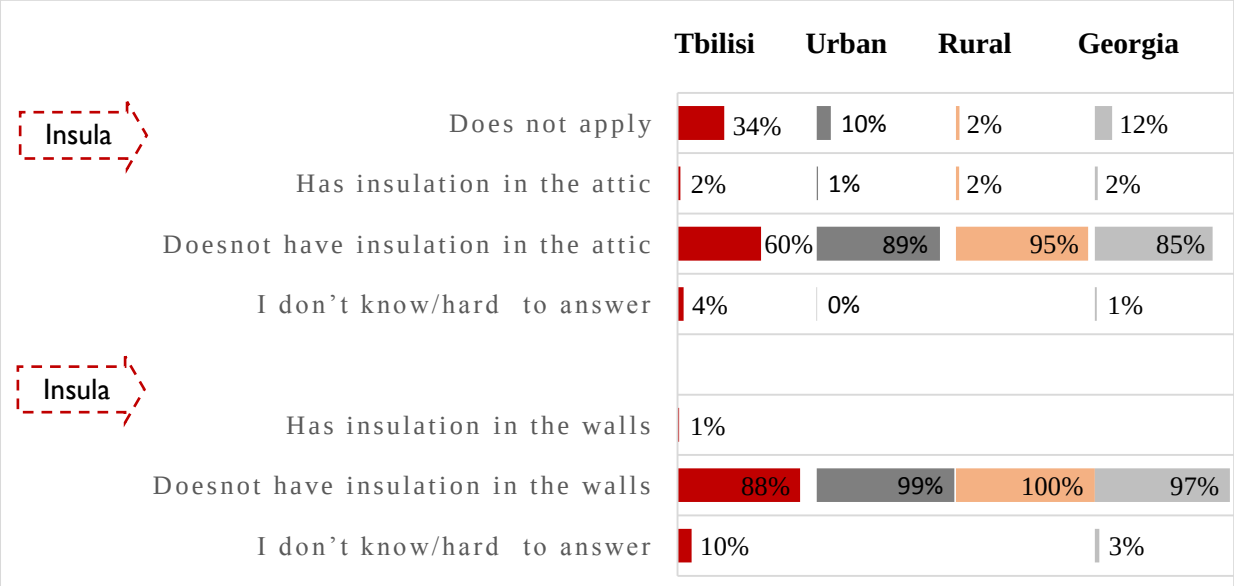
Sample size = 1200

As mentioned above, urban residents outside Tbilisi use both natural gas and the wood almost with the same share (see figure #10). Analysis of the cold air infiltration reduction measures show that even window replacement is the most common practice, those who use wood as a min energy source for heating report window replacement less while sticking plastic over the window and hanging thick curtains is more common among wood users when compared to those who heat dwelling with natural gas. There were few natural gas users who report that they use to stick plastic over the window and hang tick curtains to reduce cold air infiltration.

In general for the households who have individual central heating or boiler systems it's quite uncommon to use simple measures against cold air infiltration: the majority of them have replaced the windows.

Using insulation means for better thermo stability of the building is not common practice, neither in Tbilisi nor in other urban or rural areas – only a few households state that the buildings their dwellings are located in have insulation in the attic or walls. Due to the small number of cases in which insulation is used, it is impossible to perform a statistical analysis of insulation means. In general, respondents name mineral wool (mainly in Tbilisi), filters and reflectors (in other urban areas) and ground/dirt (in rural areas).

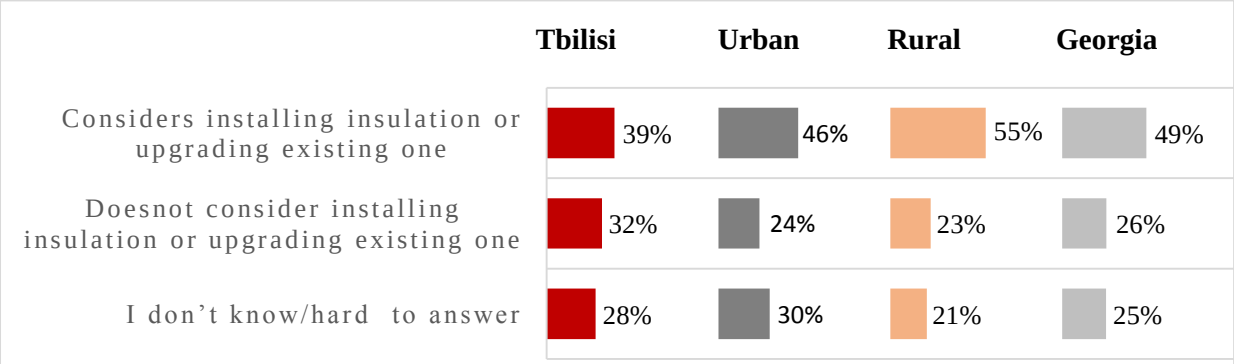
Figure 16 – Use of insulation



Sample size = 1200

Twenty five percent of respondents find it difficult to define whether or not they will install insulation or upgrade the existing one in the future, although a significant number of households, especially from rural areas state that they will.

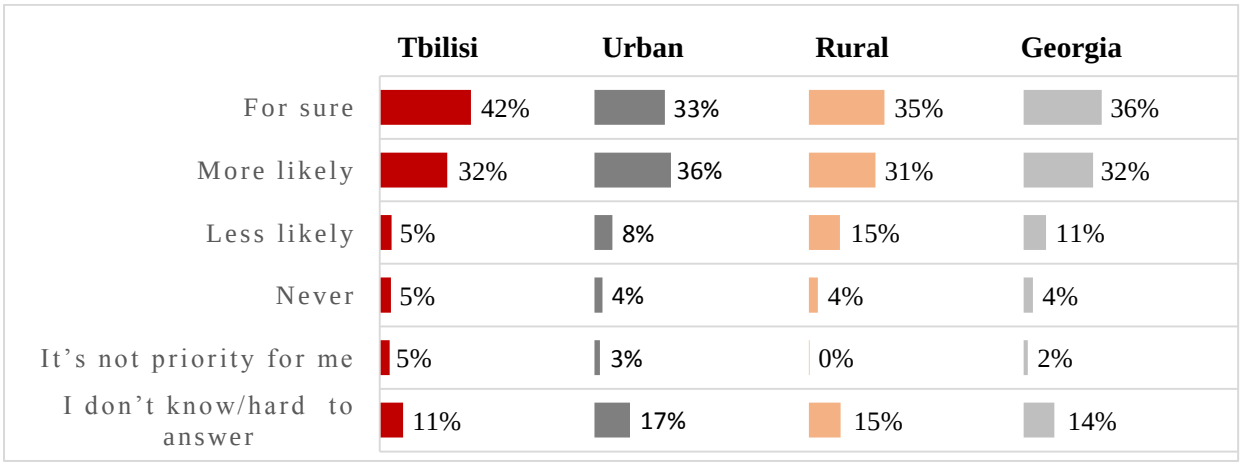
Figure 17 – Planning installment of insulation



Sample size = 1200

As for the respondents' attitudes toward energy efficient heating systems, a great majority of the surveyed population states that they will purchase efficient appliances for sure or more likely.

Figure 18 – Likelihood of buying efficient heating system or appliance in the future



Sample size = 1200

HEATING BY TARGET MUNICIPALITIES

Almost all households in Gori, rural as well as urban areas, heat each room or some rooms separately with various facilities. Central heating is accessible for a small part of the households although the figure is much higher in Tbilisi and Akhaltsikhe town (14.20 percent). It is noteworthy that the largest part of dwelling spaces is heated in the same cities (Tbilisi 63 percent and Akhaltsikhe 55 percent). The smallest part of dwelling space is heated in Gori rural areas (24 percent).

Table 14 – Main heating systems by municipalities

Municipalities		Local heating	Individual Central Heating
Tbilisi		74%	**14%**
Kutaisi		87%	8%
Batumi		85%	5%
Rustavi		86%	6%
Poti		95%	2%
Gori	Urban	**93%**	3%
	Rural	**100%**	0%
	TOTAL	**97%**	1%
Zugdidi	Urban	89%	7%
	Rural	93%	2%
	TOTAL	92%	4%
Zestafoni	Urban	89%	3%
	Rural	96%	1%
	TOTAL	93%	2%
Akhaltsikhe	Urban	77%	**14%**
	Rural	90%	2%
	TOTAL	84%	8%
Telavi	Urban	90%	0%
	Rural	**99%**	0%
	TOTAL	96%	0%

Sample size = 3800

Considering the fact that access to natural gas is very low in Poti (only 14 percent), the smallest share of households use it for heating houses (three percent). A majority of households in Poti, Telavi and Akhaltsikhe cities heat dwellings mainly with wood. Also, almost all households in Gori, Telavi and Akhaltsikhe rural areas predominantly use wood for heating houses. It should be noted that there is no access to natural gas in the sampled villages of Akhaltsikhe.

Table 15 – Main Fuel for Heating by Target Municipalities

Municipalities		Natural gas	Electricity from power company	Wood
Tbilisi		**88%**	10%	2%
Kutaisi		72%	17%	12%
Batumi		41%	36%	21%
Rustavi		87%	11%	2%
Poti		**3%**	**34%**	**62%**
Gori	Urban	57%	4%	38%
	Rural	4%	0%	**95%**
	TOTAL	22%	2%	77%
Zugdidi	Urban	23%	13%	**59%**
	Rural	0%	1%	90%
	TOTAL	9%	6%	78%
Zestafoni	Urban	71%	8%	22%
	Rural	6%	0%	94%
	TOTAL	27%	3%	70%
Akhaltsikhe	Urban	32%	2%	**65%**
	Rural	**0%**	2%	**98%**
	TOTAL	17%	2%	81%
Telavi	Urban	32%	1%	**67%**
	Rural	4%	0%	**96%**
	TOTAL	12%	1%	87%

Sample size = 2518

For the majority of Tbilisi, Rustavi and Gori residents, price is the main factor in deciding which energy source to use for heating. Price is the main criteria in all urban areas of target municipalities except Zugdidi town, where a majority of households name access to energy sources as the main factor defining their choice. The same factor is defining the choice of households living in rural areas of target municipalities, especially in Gori and Akhaltsikhe villages (78-79 percent). More than one-third of respondents from Zestafoni rural areas as well as one-fourth of residents in Batumi city state that there is no choice/alternative in terms of heating energy sources.

The average number of months in which heating is on is highest in Akhaltsikhe and Telavi rural areas (9 and 8 months). Every fourth surveyed household in Tbilisi and Rustavi states they have heating switched on for 24 hours. Residents of Zestafoni, Zugdidi and Gori rural areas have the heating switched on for longer hours than in other villages of target municipalities (12-13 hours).

Only two percent of households in Gori villages state they have implemented different measures to reduce cold air infiltration in the home. Only one-fifth of residents in Batumi, Gori and Akhaltsikhe towns state the same. Behavior differs across survey target areas: more households in Tbilisi try to improve thermo isolation conditions and the main way for this is the replacement of window frames with more thermostatic materials and weather stripping. Replacement of window frames is the most common practice in almost all urban areas of target municipalities, although a majority of households in Gori municipality stick

plastic over window frames. Every fifth household in Zugdidi villages uses thick short curtains to reduce cold air infiltration at home.

Almost nobody has insulation in the walls in any target municipality. The share of households with insulation in the attic is also low. The largest share of such households is represented in Telavi town. It is noteworthy that the majority of those who have insulation in the attic in Telavi state that the building was built with it.

Table 16 – Insulation by Target Municipalities

Municipalities		Insulation in the Attic	Insulation in the Walls
Tbilisi		2.1%	1.1%
Kutaisi		0.8%	0.3%
Batumi		2.1%	2.6%
Rustavi		0.5%	0.3%
Poti		0.8%	0.3%
Gori	Urban	0.8%	0.8%
	Rural	2.0%	0.0%
	TOTAL	1.6%	0.3%
Zugdidi	Urban	0.7%	0.7%
	Rural	0.9%	0.0%
	TOTAL	0.8%	0.3%
Zestafoni	Urban	0.0%	0.0%
	Rural	0.8%	0.0%
	TOTAL	0.5%	0.0%
Akhaltsikhe	Urban	5.8%	0.5%
	Rural	7.4%	0.0%
	TOTAL	6.6%	0.3%
Telavi	Urban	**10.0%**	0.8%
	Rural	1.5%	0.0%
	TOTAL	4.1%	0.3%

Sample size = 3800

The majority of the respondents in Kutaisi city as well as Zestafoni villages, state that they will install insulation or upgrade existing insulation in the future (64 percent).

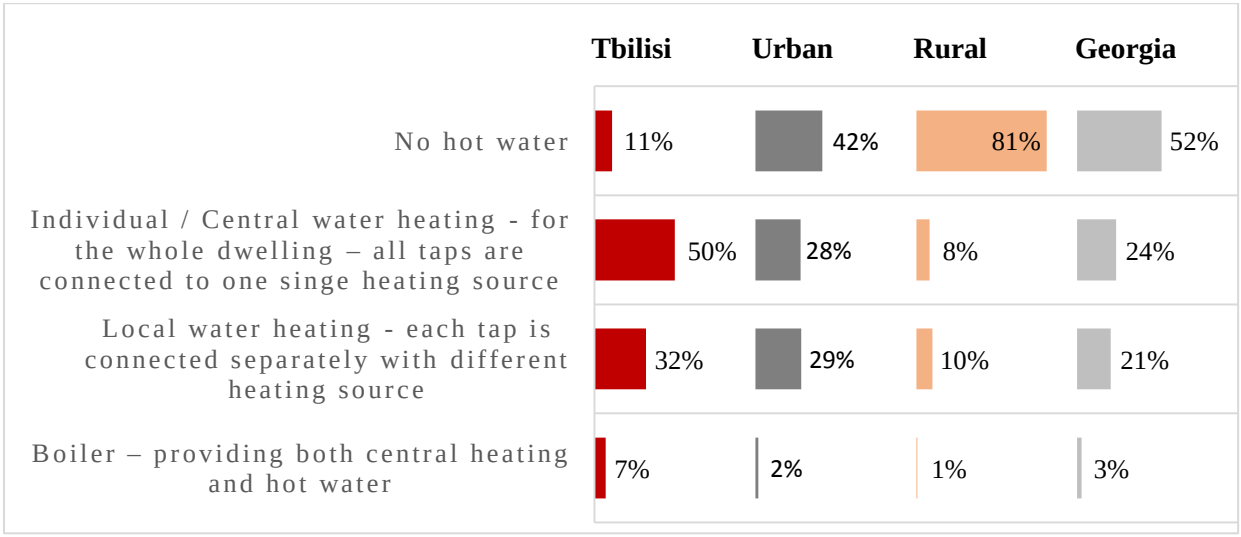
As for the respondents' attitude toward energy efficient heating systems, a great majority of the surveyed population in Zugdidi municipality states that they will purchase efficient appliances for sure (60 percent).

2.2.3 Water Heating

Based on survey results, every second household in the country doesn't have hot water from the tap at all. The share of households without hot water from the tap is extremely high in rural areas, where the majority of the households report no access to hot water (81 percent). In the capital there are 11 percent of households without hot water from the tap. The situation is moderate in other urban areas where 42 percent of respondents state that they don't have hot water in their homes.

For Tbilisi residents the main method of heating water is a centralized individual heater connected to several taps in the dwelling (50 percent); seven percent have a unified system for heating and hot water and about the third of the respondents (32 percent) use local water heating, meaning that the tap / each tap is connected to the individual heating point.

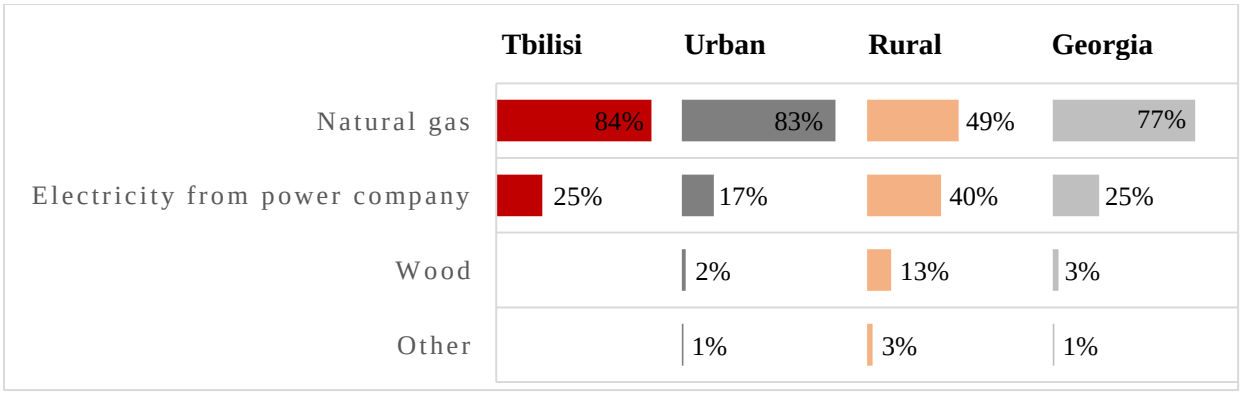
Figure 19 – Used hot water systems



Sample size = 1200

Natural gas is the main energy source for producing hot water in the home, but the share of those using electricity for water heating is higher in the villages.

Figure 20 – Energy sources used for water heating

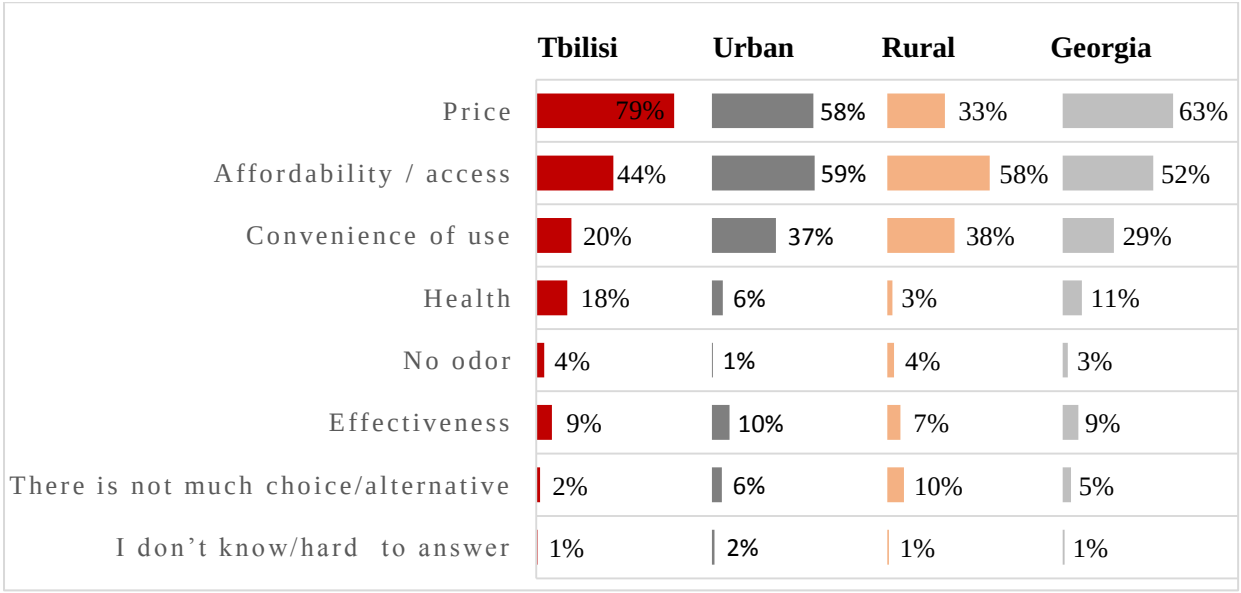


Sample size = 591

In Tbilisi, price is the main factor in choosing an energy source for heating water. Although price is an important selection criteria for the inhabitants of other areas, considering access

limitations, many rural residents and residents of urban areas outside the capital choose an energy source based on its accessibility. Access to the energy source is an important decision making criteria for all of the surveyed population in deciding how to heat water.

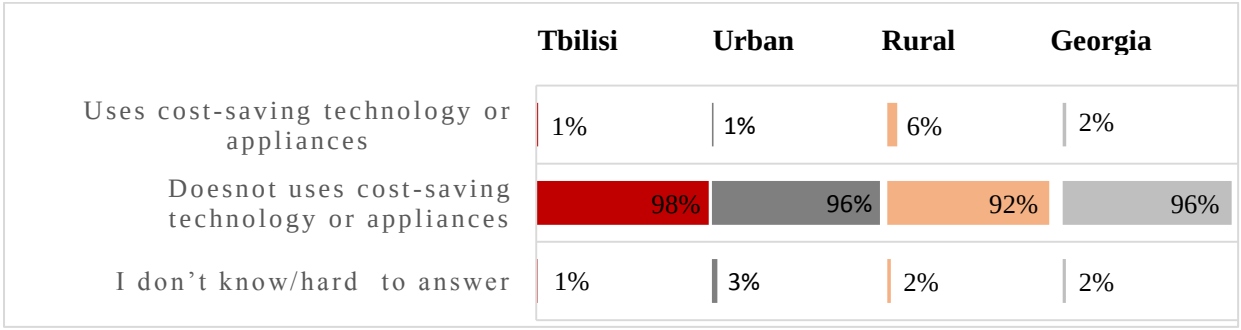
Figure 21 – Factors considered while deciding which fuel to use for water heating



Sample size = 591

Only very few respondents use any type of cost saving technologies or appliances to reduce hot water usage and related costs.

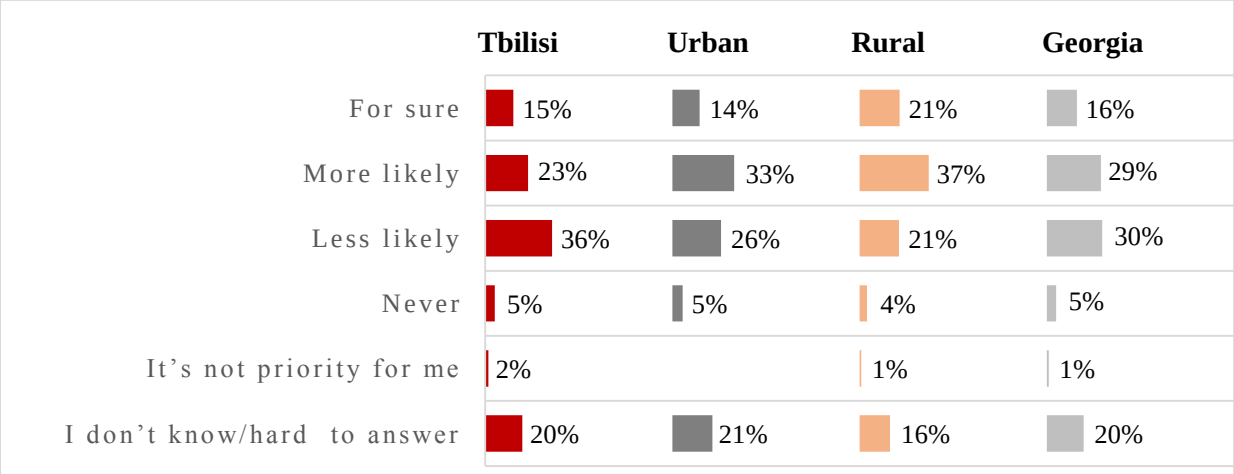
Figure 22 – Use of the cost-saving technology or appliances to reduce water heating usage and cost



Sample size = 591

Together with the fact that almost none of the respondents implement hot water usage and cost reduction behavior, based on the survey results it is less likely in the future to expect major changes in this regard – most of the respondents either don't know whether they will change behavior or think it is not likely.

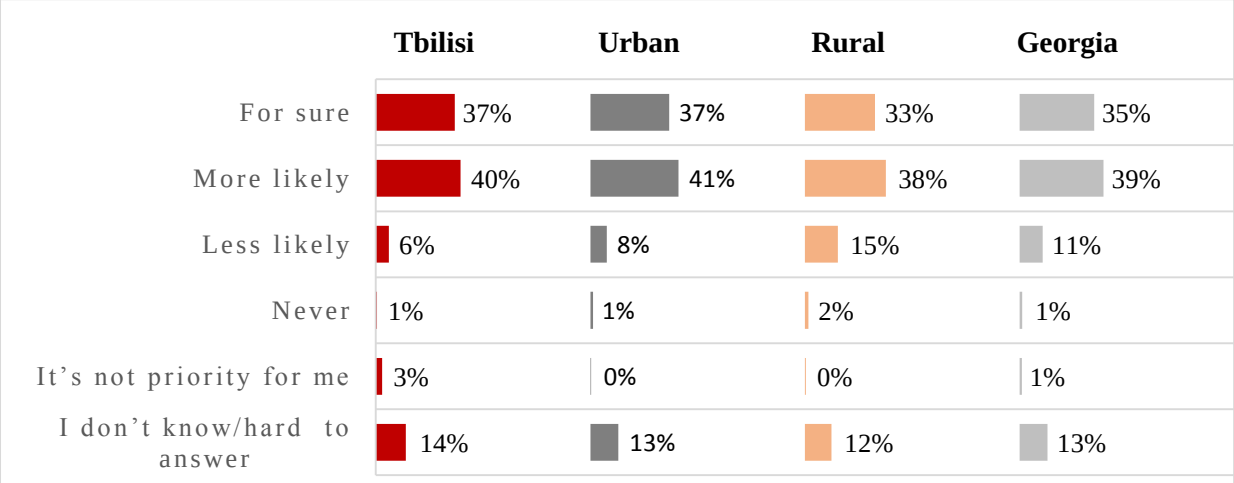
Figure 23 – Likelihood of implementing hot water reduction behavior



Sample size = 591

As for respondents' attitudes toward purchasing efficient water heating appliances when they have to change their existing one, a majority state it is for sure or more likely to purchase an energy efficient appliance.

Figure 24 – Likelihood of purchasing energy efficient water heating technologies / appliances in the future



Sample size = 1200

WATER HEATING BY TARGET MUNICIPALITIES

Survey results show that almost all residents of Gori and Akhaltsikhe villages state that they do not have hot water from the tap at all. Almost half of the households in Poti, Zestafoni and Akhaltsikhe towns also are without hot water from the tap. For urban residents of Gori and Telavi, the main way to heat water is by using local water heating equipment. With this system, each tap is connected to an individual heating point (68-69 percent). Half of Tbilisi and Zestafoni urban citizens have centralized individual heaters connected to several taps in the dwelling (49-50 percent). Water heating means do not vary according to season.

Price is considered an important selection criterion for most inhabitants of urban areas in target municipalities, while majority of rural residents in those municipalities choose energy sources based on accessibility. Usage convenience is an important decision making criterion for majority of the residents in Gori town while deciding how to heat water. Every third inhabitant of Gori town also states that there is no other alternative.

Table 17 – Factors considered while deciding which fuel to use for water heating by Target Municipality

Municipalities		Price	Affordability / access	Convenience of use	There is not much choice/alternative	I don't know
Tbilisi		**78%**	40%	25%	4%	1%
Kutaisi		**67%**	**60%**	27%	3%	0%
Batumi		33%	52%	24%	23%	3%
Rustavi		**74%**	58%	34%	8%	1%
Poti		34%	43%	36%	7%	1%
Gori	Urban	**82%**	54%	45%	0%	1%
	Rural	0%	**67%**	**67%**	**33%**	0%
	TOTAL	80%	55%	46%	1%	1%
Zugdidi	Urban	42%	**65%**	42%	3%	3%
	Rural	20%	57%	30%	10%	6%
	TOTAL	29%	60%	35%	7%	5%
Zestafoni	Urban	**66%**	39%	31%	3%	3%
	Rural	40%	**62%**	50%	4%	6%
	TOTAL	55%	48%	39%	3%	4%
Akhaltsikhe	Urban	**69%**	54%	31%	1%	1%
	Rural	55%	**64%**	46%	0%	0%
	TOTAL	67%	55%	33%	1%	1%
Telavi	Urban	53%	31%	44%	3%	0%
	Rural	40%	**63%**	39%	4%	0%
	TOTAL	47%	47%	42%	4%	0%

Sample size = 2084

The number of residents using cost-saving technologies is too low to analyze the types of such technologies according to municipality. However, it is worth mentioning that a majority of residents in rural areas of target municipalities state that they will implement hot water use reduction behaviors in the future for sure or more likely. Such tendency is more prominent in

Akhaltsikhe municipality where 65 percent of citizens show a willingness to do so in the future, while only one-fifth of inhabitants in Gori town state they will do the same.

A vast majority of the population of target municipalities is willing to buy energy efficient water heating technologies in the future, except Poti town and Gori villages where only half of residents state the same.

Table 18 – Likelihood of implementing hot water reduction behavior and purchasing energy efficient water heating technologies / appliances in the future

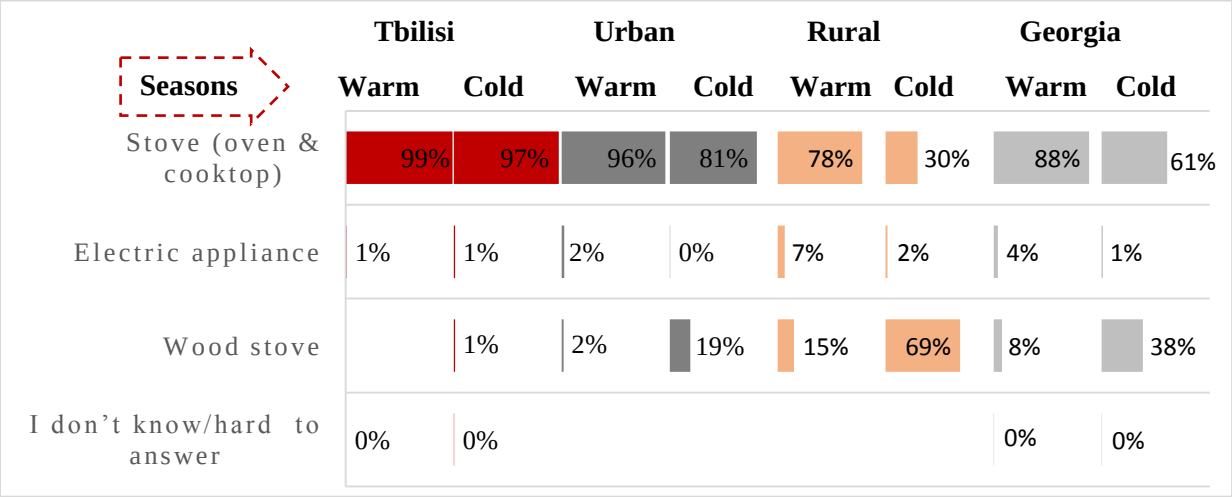
Municipalities		Hot water reduction	Energy efficient water heating technologies
Tbilisi		36%	75%
Kutaisi		53%	77%
Batumi		33%	61%
Rustavi		40%	69%
Poti		31%	**50%**
Gori	Urban	**22%**	72%
	Rural	67%	**47%**
	TOTAL	**23%**	55%
Zugdidi	Urban	47%	85%
	Rural	53%	76%
	TOTAL	50%	80%
Zestafoni	Urban	54%	85%
	Rural	66%	77%
	TOTAL	59%	80%
Akhaltsikhe	Urban	68%	80%
	Rural	36%	72%
	TOTAL	**65%**	76%
Telavi	Urban	41%	81%
	Rural	65%	85%
	TOTAL	53%	83%

Sample size = 2084

2.2.4 Cooking Behavior

Household cooking appliances vary significantly by urban and rural communities. For urban area residents and especially for households in Tbilisi, the main cooking means is a stove, while a wood stove is the most frequently used cooking appliance for rural households.

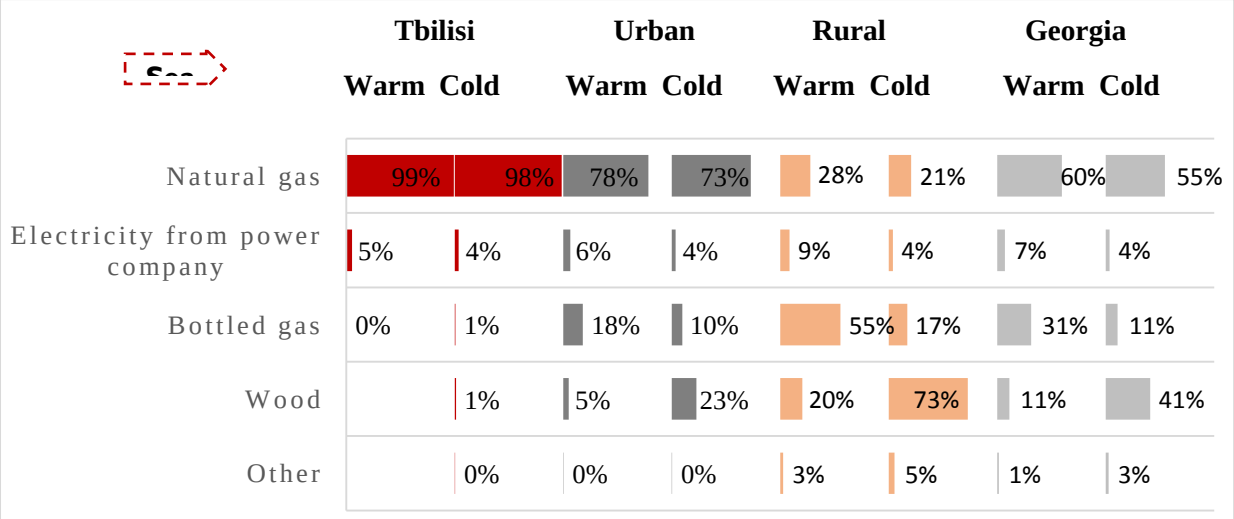
Figure 25 – Technology/appliance used for cooking



Sample size = 1200

As for the energy sources used for cooking, natural gas is mostly used. In urban areas other than Tbilisi, due to limited access to a natural gas pipeline, bottled gas is the main cooking source. In rural areas wood is widely used for cooking, especially during cold seasons.

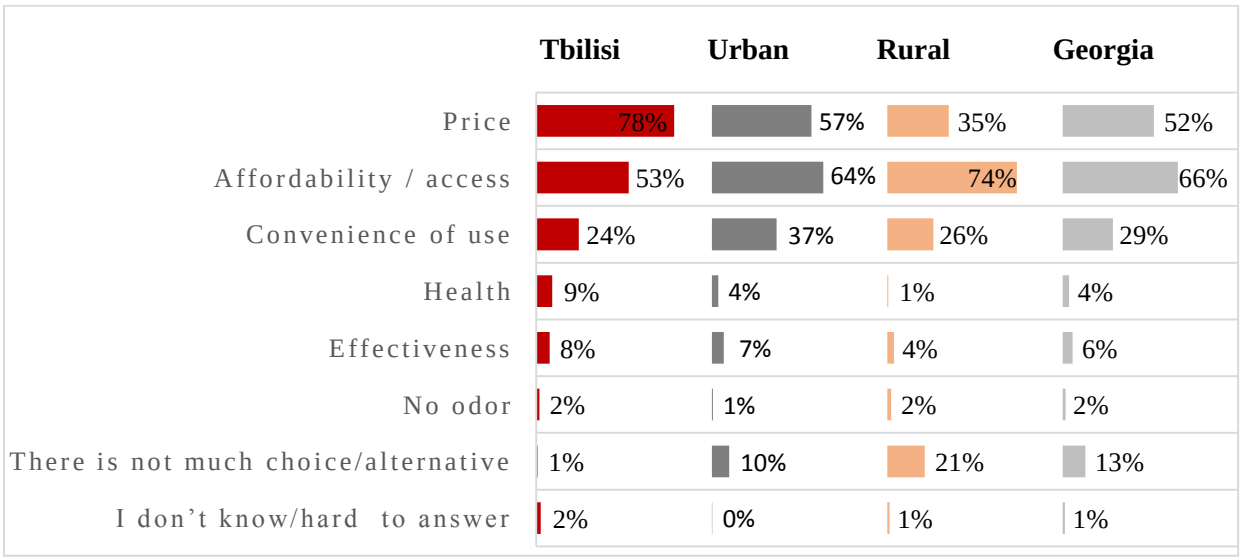
Figure 26 – Energy sources used for cooking



Sample size = 1200

Like other cases, Tbilisi residents choose energy sources for cooking mainly based on price, while for rural residents accessibility is the main selection criterion. Also, many rural respondents state that they don't have many alternatives to choose from among cooking energy sources.

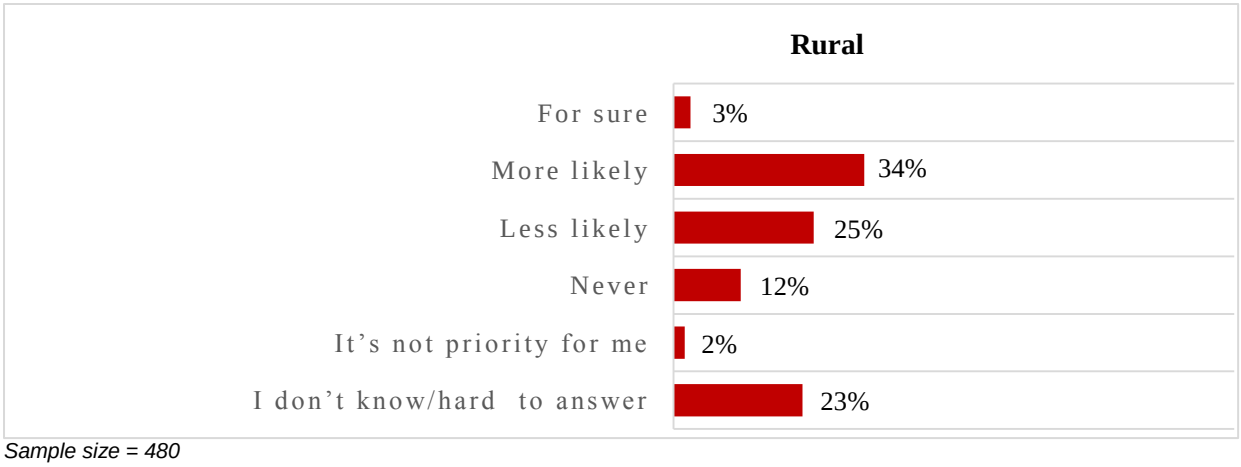
Figure 27 – Factors considered while deciding which energy source to use for cooking



Sample size = 1200

More than one-third of rural residents, who are primary users of wood stoves, consider switching to energy efficient wood stoves in the future, but the share of those who are not definite in this regard is also large.

Figure 28 – Likelihood of switching to energy efficient wood stove among rural residents, who use wood stove



Sample size = 480

COOKING BEHAVIOR BY TARGET MUNICIPALITIES

The main cooking appliance used by the vast majority of households in Tbilisi, Kutaisi, Batumi, Rustavi, Zestafoni and Telavi towns is a gas stove. There is almost no change in this data according to season. However, there is a significant difference between the usage of cooking appliance types according to season in Poti and Zugdidi towns as well as in rural areas of almost all target municipalities. Residents of the above-mentioned areas use a gas stove for cooking during the warm season, while the main cooking appliance is a wood stove in the cold season in the same areas.

Table 19 – Technology/appliance used for cooking by Target Municipalities

Municipalities		WARM SEASON		COLD SEASON	
		Gas Stove	Wood Stove	Gas Stove	Wood Stove
Tbilisi		**99%**	0.0%	**97%**	1%
Kutaisi		**95%**	0.3%	**92%**	4%
Batumi		**98%**	0.0%	**93%**	5%
Rustavi		**100%**	0.0%	**99%**	1%
Poti		**92%**	2%	**52%**	**43%**
Gori	Urban	**99%**	1%	89%	**11%**
	Rural	**92%**	6%	18%	**80%**
	TOTAL	**94%**	4%	42%	57%
Zugdidi	Urban	79%	**9%**	38%	**59%**
	Rural	65%	**28%**	5%	**94%**
	TOTAL	70%	**21%**	18%	81%
Zestafoni	Urban	**100%**	0.0%	**93%**	6%
	Rural	82%	**12%**	24%	**75%**
	TOTAL	88%	8%	48%	51%
Akhaltsikhe	Urban	85%	2%	54%	45%
	Rural	63%	**15%**	4%	**96%**
	TOTAL	74%	9%	29%	70%
Telavi	Urban	100%	0.0%	**98%**	3%
	Rural	97%	1%	70%	30%
	TOTAL	98%	1%	78%	21%

Sample size = 3800

As for the energy sources used for cooking, natural gas is mostly used by a vast majority in Tbilisi, Kutaisi, Gori, Rustavi, Zestafoni and Telavi during all seasons. It is noteworthy that bottled gas and LPG as well as natural gas is used almost by the same share of residents in Batumi town the whole year (natural gas 52-53 percent, bottled gas/LPG 44-47 percent). As there is very limited access to natural gas in Poti and Akhaltsikhe, accordingly bottled gas/LPG and electricity are widespread energy sources for cooking. Bottled gas/LPG is used for cooking by a majority of residents in all rural areas of target municipalities except Telavi. Wood is mainly used in the cold season in rural areas. The consumption of wood is quite significant only in Akhaltsikhe villages during the warm season.

Table 20 – Technology/appliance used for cooking by Target Municipalities

Municipalities		WARM SEASON				COLD SEASON			
		GAS	LPG	ELECTR	WOOD	GAS	LPG	ELECTR	WOOD
Tbilisi		**99%**	0.3%	5%	0%	**99%**	1%	4%	1%
Kutaisi		**92%**	3%	6%	0%	**91%**	2%	5%	5%
Batumi		53%	47%	6%	0%	52%	44%	6%	8%
Rustavi		**100%**	2%	8%	0%	**99%**	2%	7%	1%
Poti		14%	**82%**	13%	2%	10%	51%	11%	**46%**
Gori	Urban	**93%**	6%	3%	1%	**89%**	5%	3%	14%
	Rural	23%	70%	5%	8%	20%	24%	2%	**90%**
	TOTAL	47%	48%	4%	6%	43%	18%	2%	64%
Zugdidi	Urban	53%	27%	16%	11%	35%	7%	4%	**57%**
	Rural	3%	68%	12%	37%	0.4%	8%	1%	**86%**
	TOTAL	22%	52%	14%	27%	14%	8%	2%	75%
Zestafoni	Urban	**99%**	5%	7%	2%	**95%**	4%	7%	12%
	Rural	28%	59%	9%	19%	22%	11%	2%	**78%**
	TOTAL	53%	41%	8%	13%	47%	9%	3%	55%
Akhaltsikhe	Urban	63%	23%	**41%**	20%	55%	10%	24%	54%
	Rural	2%	**67%**	27%	**51%**	0%	19%	5%	**98%**
	TOTAL	33%	45%	34%	35%	28%	14%	15%	76%
Telavi	Urban	**96%**	4%	0.0%	0.0%	**93%**	4%	0.0%	10%
	Rural	66%	32%	1%	4%	53%	18%	0.0%	41%
	TOTAL	75%	24%	1%	3%	65%	14%	0.0%	32%

Sample size = 3800

Price and accessibility are considered to be the main factors in choosing energy sources to be used for cooking in almost all municipalities. Accessibility as the selection criteria is important only for half of Tbilisi and Zestafoni town residents. Convenience of usage is the most important decision-making factor for selecting energy sources for cooking in Gori and Telavi towns (56-58 percent). Some residents state that there are not many alternatives for making choices in rural areas of Zestafoni and Zugdidi as well as in Batumi town (Zestafoni – 29 percent, Zugdidi – 19 percent, Batumi – 17 percent).

Table 21 – Factors considered while deciding which energy source to use for cooking By Target Municipalities

Municipalities		Price	Access	Convenience of use	Effectiveness	There is not much choice/alternative
Tbilisi		78%	**48%**	29%	9%	1%
Kutaisi		66%	57%	29%	12%	3%
Batumi		40%	53%	25%	13%	**17%**
Rustavi		76%	62%	41%	17%	4%
Poti		47%	53%	27%	10%	9%
Gori	Urban	79%	73%	**56%**	2%	1%
	Rural	46%	**80%**	14%	0.0%	2%
	TOTAL	57%	77%	28%	1%	2%
Zugdidi	Urban	60%	77%	31%	3%	6%
	Rural	25%	**69%**	21%	2%	**19%**
	TOTAL	39%	72%	25%	2%	14%
Zestafoni	Urban	72%	**49%**	40%	13%	9%
	Rural	38%	**71%**	38%	2%	**25%**
	TOTAL	50%	63%	39%	6%	19%
Akhaltsikhe	Urban	65%	55%	48%	14%	4%
	Rural	56%	**80%**	24%	12%	2%
	TOTAL	61%	67%	36%	13%	3%
Telavi	Urban	50%	39%	**58%**	18%	3%
	Rural	35%	**59%**	41%	4%	5%
	TOTAL	40%	53%	46%	8%	4%

Sample size = 3800

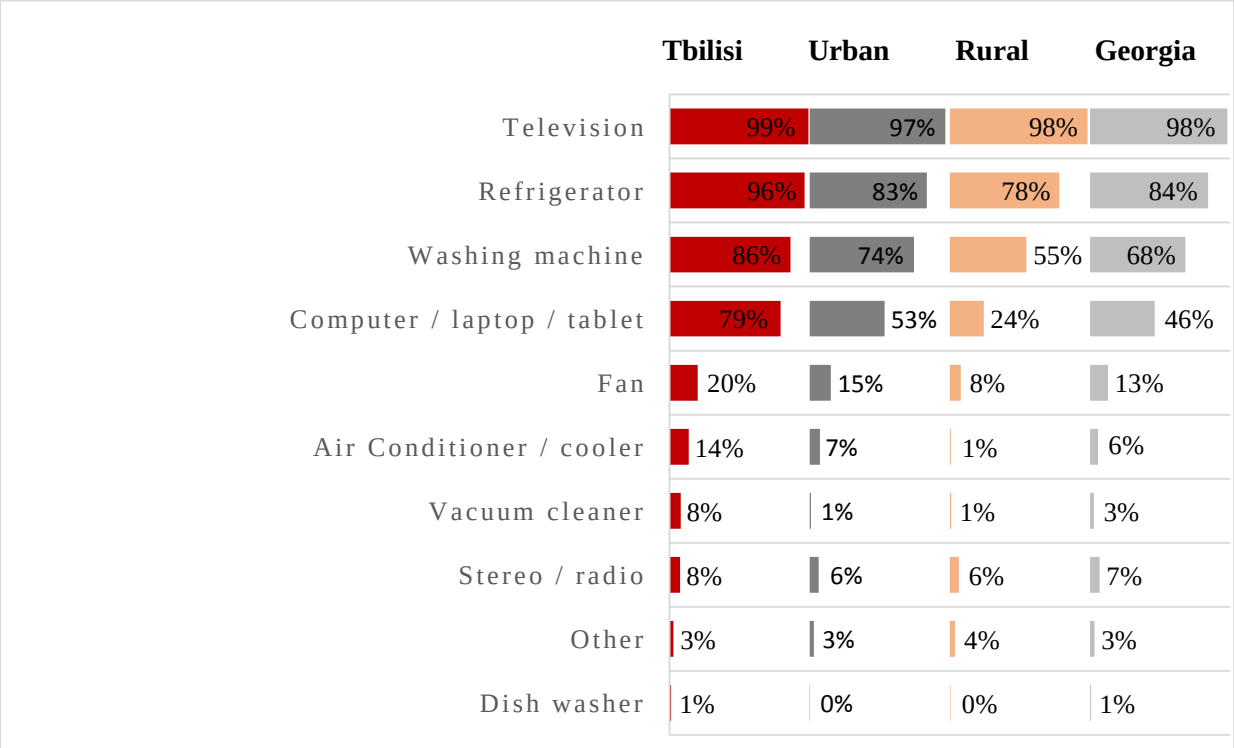
The number of primary users of wood stoves is very low in some municipalities and could not be analyzed on the municipality level. A significant number of such residents is exist only in Zugdidi, Poti and Akhaltsikhe municipalities, and the data shows that a majority of them will buy energy efficient wood stoves for sure or more likely in the future.

2.3 Home Appliances

2.3.1 Ownership of Home Appliances

The absolute majority of the households own a TV set. The second most frequently owned home appliance is the refrigerator, but it should be mentioned that more than every fifth respondent doesn't own a refrigerator. The share of households with washing machines is lower among rural residents and in general, ownership of home appliances is somewhat lower in rural areas. Detailed data on ownership of different home appliances is presented in the figure below:

Figure 29 – Ownership of Home Appliances



Sample size = 1200

OWNERSHIP OF HOME APPLIANCES BY TARGET MUNICIPALITY

According to study results, the most common appliances owned by households are TV sets, refrigerators, washing machines and computers. A vast majority of the population in target municipalities owns a TV set as well as a refrigerator. A slightly lower share of the population owns refrigerators in Gori rural areas (60 percent). Washing machines are also quite frequently owned by a majority in all municipalities except Gori and Zugdidi where the share of such residents does not make even half of the total population (Gori – 41 percent, Zugdidi – 47 percent). A significant difference is revealed in regards to computer ownership, which is widespread in urban areas, while only part of the residents own them in rural areas. The smallest share of computer ownership is identified in Gori villages (14 percent).

Table 22 – Ownership of Home Appliances by Target Municipality

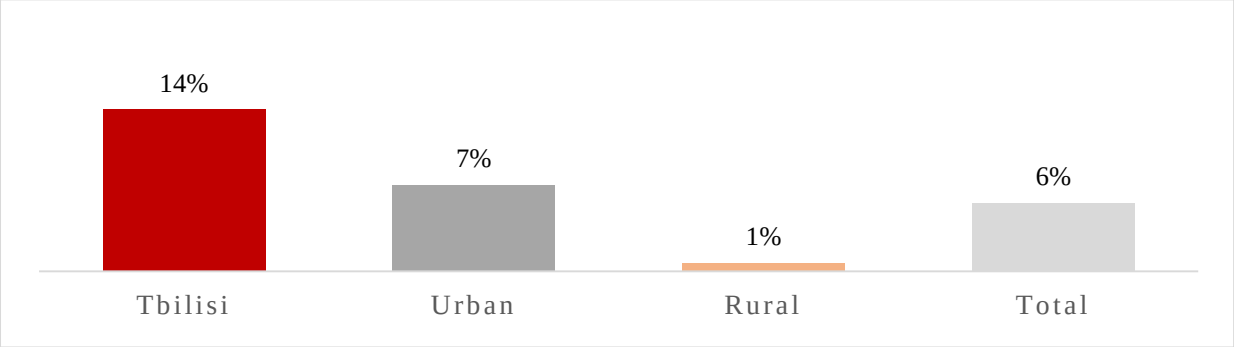
Municipalities		Television	Refrigerator	Washing machine	Computer / laptop / tablet
Tbilisi		99%	96%	86%	80%
Kutaisi		99%	88%	76%	65%
Batumi		99%	96%	84%	63%
Rustavi		98%	93%	83%	72%
Poti		98%	84%	68%	43%
Gori	Urban	99%	82%	71%	55%
	Rural	98%	**61%**	**41%**	**14%**
	TOTAL	98%	68%	51%	28%
Zugdidi	Urban	99%	81%	57%	43%
	Rural	97%	77%	**47%**	**31%**
	TOTAL	98%	78%	51%	36%
Zestafoni	Urban	96%	92%	70%	59%
	Rural	100%	91%	57%	**26%**
	TOTAL	98%	91%	62%	38%
Akhaltsikhe	Urban	99%	86%	79%	60%
	Rural	98%	78%	64%	**26%**
	TOTAL	99%	82%	72%	43%
Telavi	Urban	99%	91%	78%	66%
	Rural	99%	81%	62%	**33%**
	TOTAL	99%	84%	67%	43%

Sample size = 3800

2.3.2 Air Conditioner

In general, air conditioner ownership level is not high. Conditioners are most frequently owned by Tbilisi residents although there are only 14 percent of the households in the capital who own air conditioners. Due to the low number of the households outside Tbilisi, detailed information on air conditioner ownership is presented for Tbilisi only.

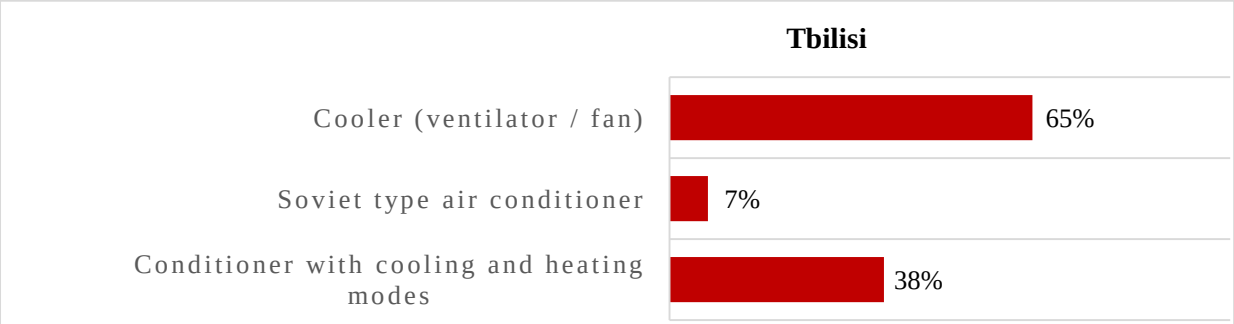
Figure 30 – Ownership of Air Conditioners



Sample size = 1200

Together with the fact that only a small number of Tbilisi residents own an air conditioning appliance, a majority of them have simple coolers and (ventilator or fan) and 38 percent own a heat pump; It's interesting that a small part of households still own a soviet type air conditioner,

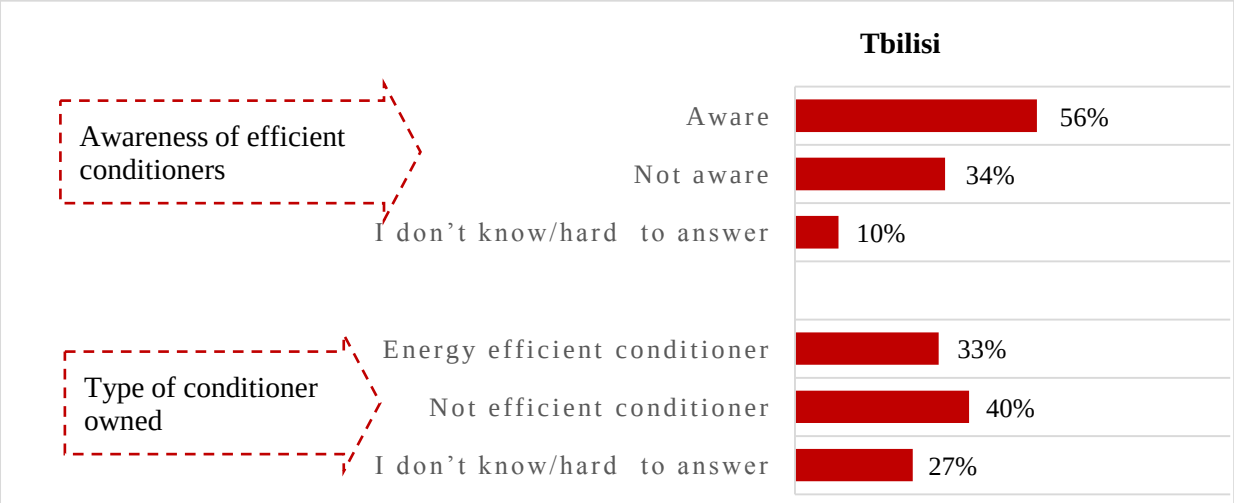
Figure 31 – Type of Air Conditioner Owned



Sample size = 216

Tbilisi residents who own conditioners usually cool their homes from June until late September. Usually the conditioner is on an average of four hours a day and about 60 percent of the living area is cooled.

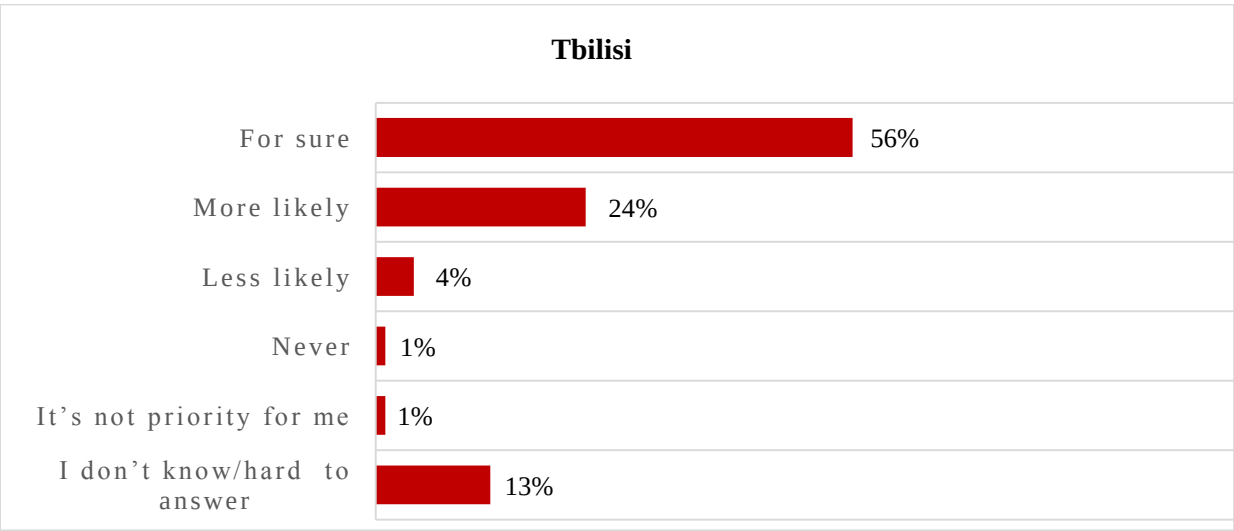
Figure 32 – Awareness of Energy Efficient Air Conditioners and Type of Conditioner Owned



Sample size = 216

A majority of the households form Tbilisi who currently own air conditioners expect to buy energy efficient appliances in the future when a replacement is made.

Figure 33 – Likelihood of Switching to an Energy Efficient Air Conditioner



Sample size = 216

AIR CONDITIONERS BY TARGET MUNICIPALITY

In general, air conditioner ownership is quite low in target municipalities. The largest share of the population with air-conditioners and coolers are in Batumi (30 percent). Every fourth resident in Poti and Kutaisi also owns this appliance. It is noteworthy that fewer households have air conditioners at home in Tbilisi than in the above-mentioned towns (14 percent). The population owning air conditioners and coolers is so low in other municipalities that the data could not be analyzed there. It should also be noted that nobody owns this particular appliance in Gori municipality.

Table 23 - Ownership of Air Conditioners by Target Municipality

Municipalities		Air Conditioner / cooler
Tbilisi		14%
Kutaisi		23%
Batumi		**30%**
Rustavi		11%
Poti		23%
Gori	**TOTAL**	**0.0%**
Zugdidi	Urban	11%
	Rural	3%
	TOTAL	6%
Zestafoni	Urban	6%
	Rural	0.4%
	TOTAL	2%
Akhaltsikhe	Urban	1%
	Rural	**0.0%**
	TOTAL	1%
Telavi	Urban	**0.0%**
	Rural	1%
	TOTAL	1%

Sample size = 3800

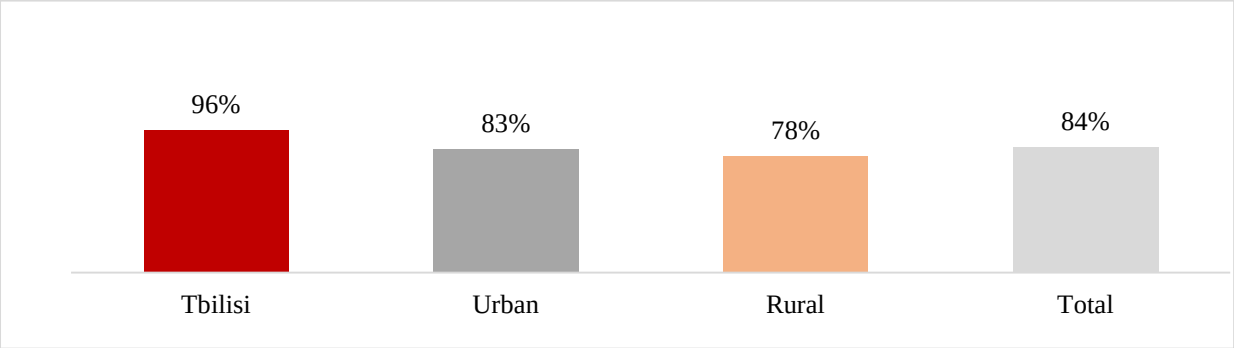
A majority of those who say they own conditioners or coolers mostly have ventilators at home, while a majority of Batumi and Kutaisi residents own conditioners with cooling and heating modes (Batumi – 69 percent, Kutaisi – 58 percent). A majority of owners also say they use them. In all target municipalities, owners of air conditioners and coolers cool more than one third of their apartments and houses. In target municipalities, the largest share of residents begin cooling their dwelling spaces in July and switch off cooling appliances mostly in September. Most cool their houses only for four hours per day during those months.

It is noteworthy that the largest share of residents unaware of more efficient air conditioners that use less electricity are located in Batumi, while a majority in Tbilisi, Kutaisi and Rustavi say they are aware of such conditioners. A majority of owners in Batumi and Kutaisi do not have energy efficient cooling appliances. The vast majority of owners in Tbilisi, Kutaisi, Rustavi, Batumi and Zugdidi are also willing to buy energy efficient air conditioners in the future. This figure is lower in Poti, where 56 percent express the same intention.

2.3.3 Refrigerator

As mentioned above, a refrigerator is one of the most frequently owned home appliances, as an absolute majority of Tbilisi residents have a refrigerator. However, the figure is lower in other urban communities and especially in rural areas.

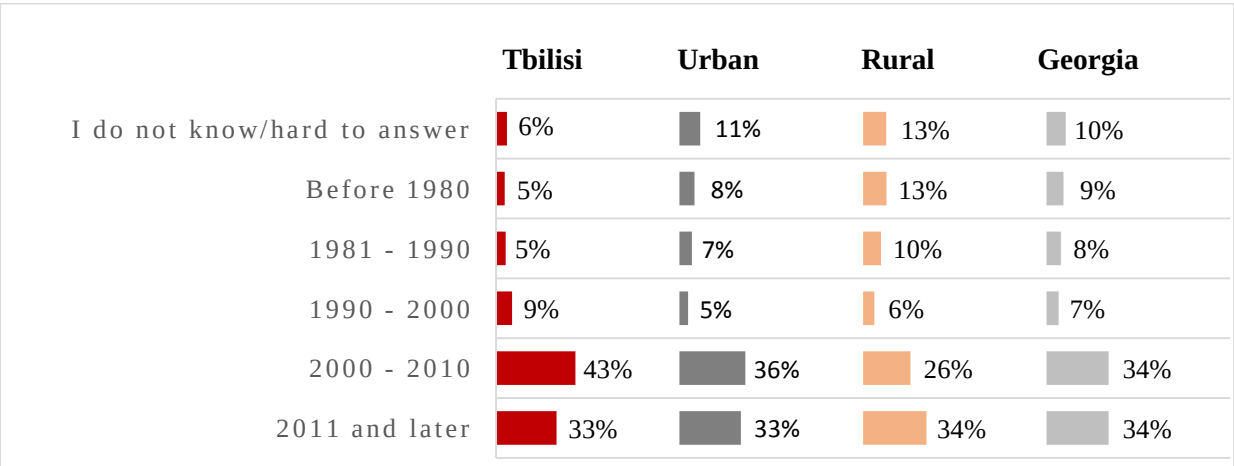
Figure 34 – Ownership of Refrigerator



Sample size = 1200

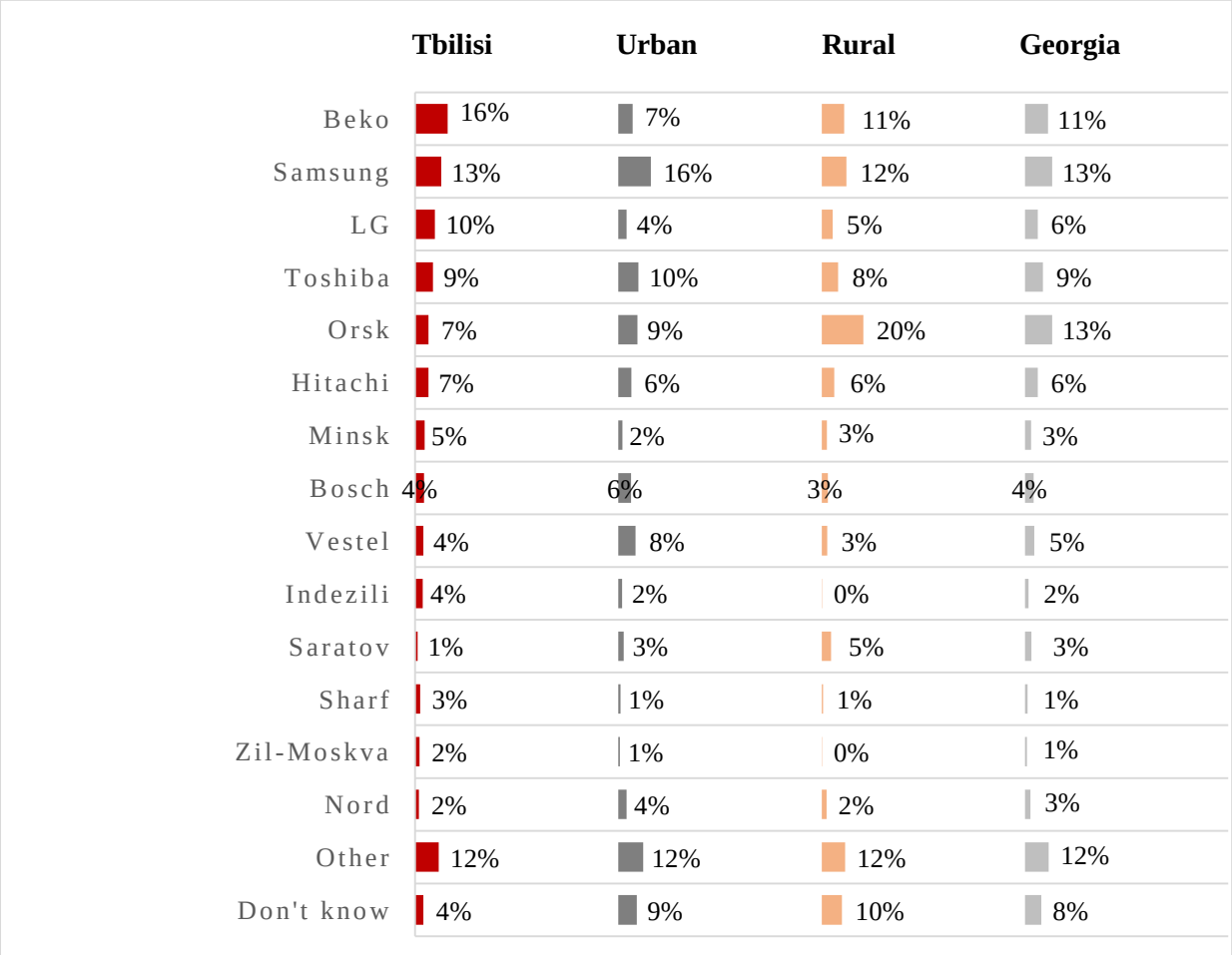
A majority of households own refrigerators produced after the year 2001, every third respondent reported that they have refrigerators produced from the last few years (2011 and later). As for refrigerator brands, the situation differs across different localities: Beko, Samsung and LG are the most frequent refrigerator brands among Tbilisi residents; and households living in outside Tbilisi urban areas own Samsung, Toshiba, Orsk and Vestel, while Orsk is the most popular refrigerator brand among rural households.

Figure 35 – Time of Issuing of Refrigerator



Sample size = 1002

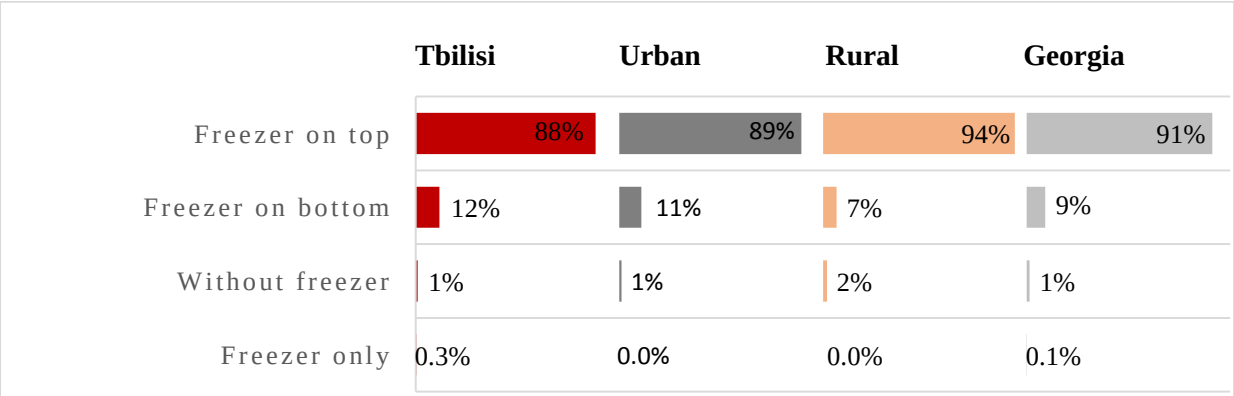
Figure 36 – Refrigerator Brands



Sample size = 1002

Only a small part of respondents own refrigerators with a freezer on the bottom – it is more usual to have a traditional type of refrigerator with the freezer on top.

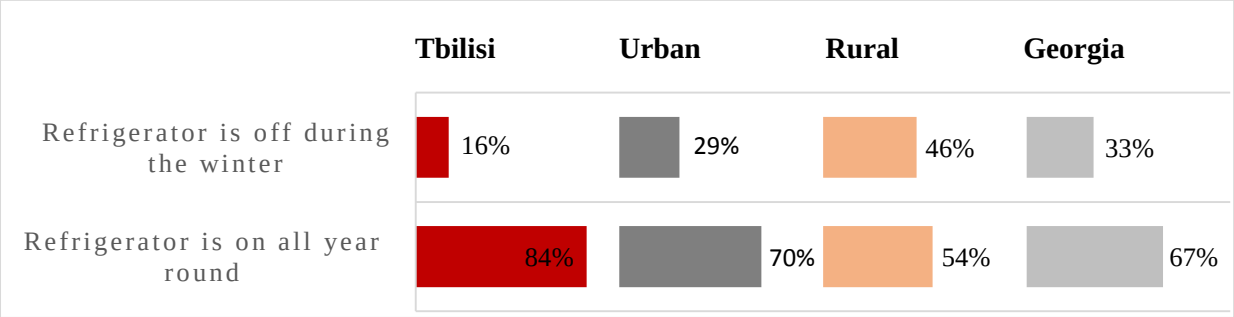
Figure 37 – Type of Refrigerator



Sample size = 1002

Switching off the refrigerator during cold seasons is more usual for rural residents – up to half (46 percent) of rural households switch off their refrigerator from November until mid-spring.

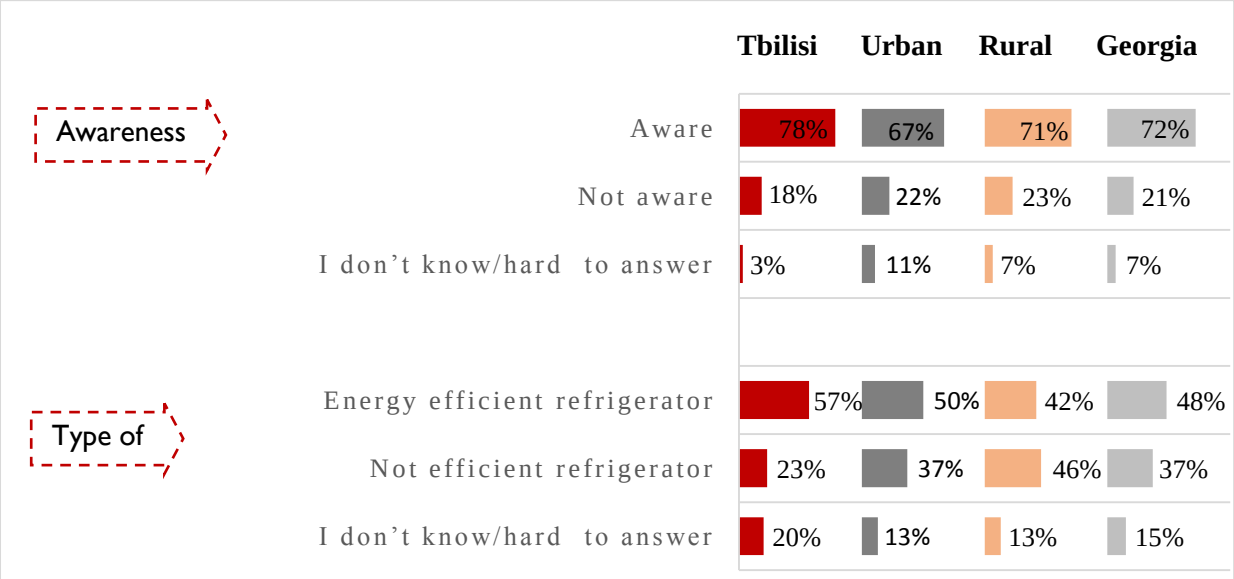
Figure 38 – Refrigerator Use Habits



Sample size = 1002

A majority of the respondents are aware of energy efficient refrigerators that use less electricity, although the number of those who own energy efficient appliances is lower, especially in rural areas.

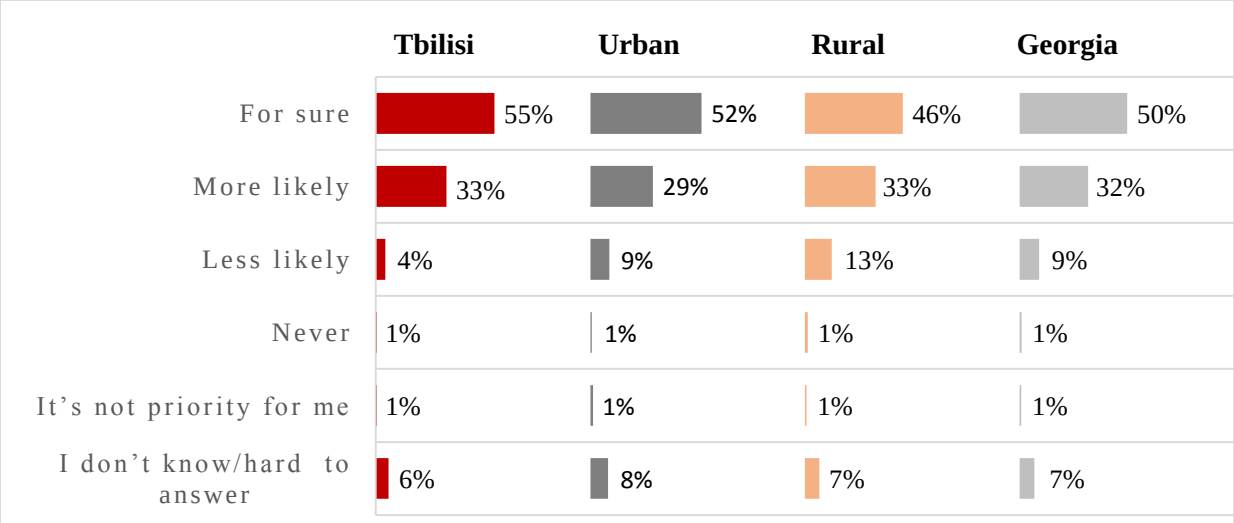
Figure 39 – Awareness of Energy Efficient Refrigerators and Type of Refrigerator Owned



Sample size = 1002

Survey results show that the majority of respondents in all survey target areas plan to buy energy efficient refrigerators in the future when they have to purchase a new one.

Figure 40 - Likelihood of Buying Energy Efficient Refrigerator



Sample size = 1002

REFRIGERATORS BY TARGET MUNICIPALITY

A majority of households own refrigerators produced after the year 2001 in all target municipalities, however it should be noted that more residents of rural areas own refrigerators produced from the last few years (after 2011). More residents in Batumi, Poti, Gori and Akhaltsikhe towns as well as Zugdidi municipality own Samsung refrigerators. In the capital of Georgia as well as in Telavi municipality, Beko is the most frequently owned refrigerator brand. It is noteworthy that Samsung is also widespread in Telavi town. Orsk is one of the most popular refrigerator brands among residents of rural areas in Gori, Zestafoni, Akhaltsikhe and Telavi. Refrigerators of Hitachi and Toshiba brands are most popular in Kutaisi. Toshiba refrigerators are presented in every sixth household in Zestafoni villages.

Table 24 – Refrigerator Brands By Target Municipality

Municipalities		Beko	Samsung	Toshiba	Hitachi	Orsk
Tbilisi		**15%**	13%	8%	7%	7%
Kutaisi		8%	11%	**12%**	**14%**	11%
Batumi		14%	**20%**	6%	8%	5%
Rustavi		14%	**16%**	8%	4%	7%
Poti		7%	**16%**	9%	9%	10%
Gori	Urban	3%	**24%**	7%	6%	12%
	Rural	3%	15%	9%	7%	**23%**
	TOTAL	3%	18%	8%	6%	19%
Zugdidi	Urban	4%	**19%**	12%	6%	6%
	Rural	5%	**24%**	10%	9%	3%
	TOTAL	4%	22%	11%	7%	4%
Zestafoni	Urban	8%	10%	8%	10%	10%
	Rural	7%	8%	**15%**	8%	**16%**
	TOTAL	7%	9%	12%	9%	14%
Akhaltsikhe	Urban	6%	**22%**	14%	7%	12%
	Rural	7%	15%	8%	5%	**19%**
	TOTAL	6%	18%	11%	6%	15%
Telavi	Urban	**27%**	19%	3%	4%	10%
	Rural	**21%**	9%	5%	4%	**20%**
	TOTAL	**23%**	12%	4%	4%	16%

Sample size = 3800

A refrigerator with a freezer on top is the most common type owned by a vast majority of residents in all target municipalities. Every forth inhabitant of Gori town own refrigerators with freezers on the bottom.

A majority of survey respondents in Telavi and Zestafoni villages have a habit of switching off refrigerators in cold seasons. Refrigerators are usually switched off in December and turned on again in March.

Half of residents in Zugdidi town are not aware of more efficient refrigerators that use less electricity. A majority of Tbilisi, Kutaisi and Rustavi inhabitants own energy efficient

refrigerators. The largest share of the population in all target municipalities will for sure or more likely buy energy efficient refrigerators in the future.

Table 25 - Awareness of More Efficient Refrigerators / Ownership of Energy Efficient Refrigerators / Likelihood of Switching to Energy Efficient Refrigerators by Target Municipality

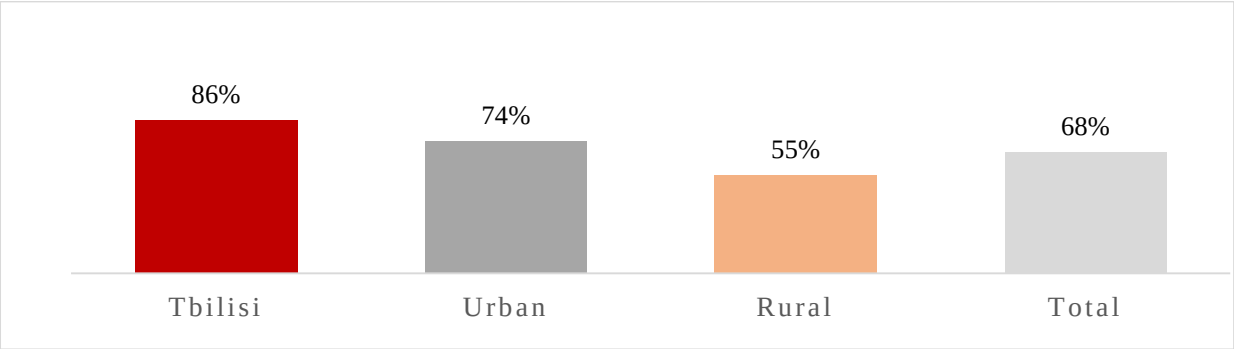
Municipalities		Awareness of more efficient refrigerators	Ownership of energy efficient refrigerators	Residents for sure or more likely to switch to energy efficient refrigerators
Tbilisi		78%	**55%**	85%
Kutaisi		72%	**55%**	76%
Batumi		60%	33%	64%
Rustavi		69%	**55%**	80%
Poti		61%	36%	56%
Gori	Urban	48%	33%	71%
	Rural	77%	35%	78%
	TOTAL	65%	34%	75%
Zugdidi	Urban	**45%**	55%	97%
	Rural	55%	49%	87%
	TOTAL	51%	51%	91%
Zestafoni	Urban	84%	**54%**	90%
	Rural	82%	49%	83%
	TOTAL	83%	51%	86%
Akhaltsikhe	Urban	67%	29%	89%
	Rural	75%	39%	67%
	TOTAL	71%	34%	78%
Telavi	Urban	67%	36%	90%
	Rural	83%	48%	93%
	TOTAL	78%	44%	92%

Sample size = 3227

2.3.4 Washing Machines

Ownership of washing machines among Tbilisi households is much higher when compared to other urban areas and especially compared to villages. In the capital, 86 percent of households own a washing machine, while only every second household (55 percent) in rural areas own this home appliance.

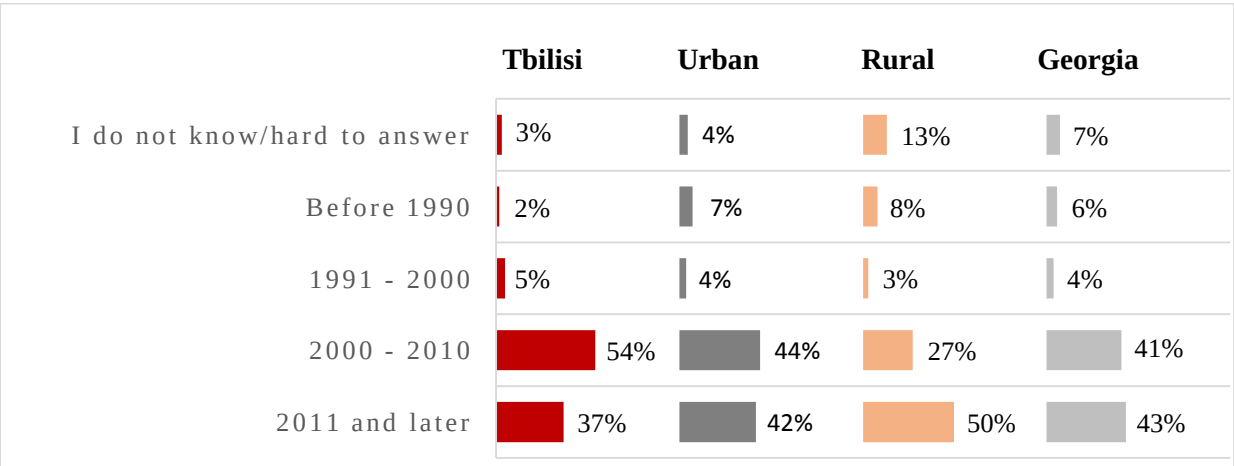
Figure 41 – Ownership of Washing Machine



Sample size = 1200

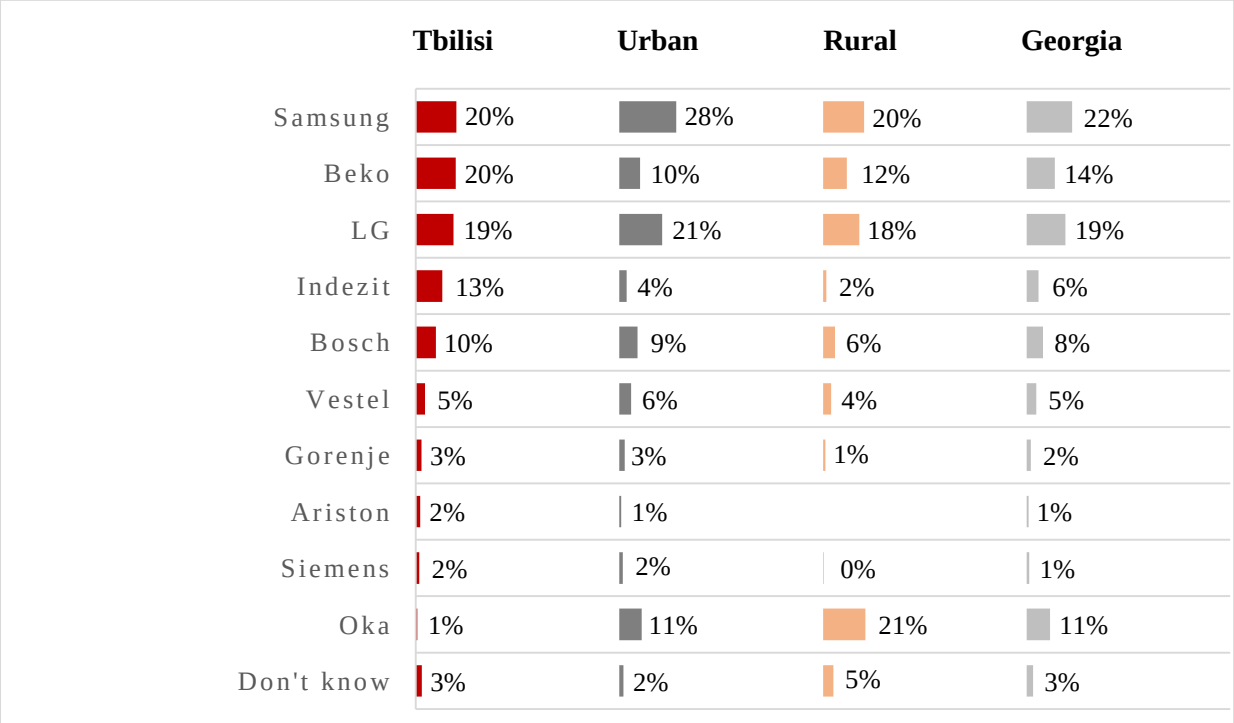
Although the share of households who own washing machines is lower among rural residents, it's worth mentioning that they have newer appliances: every second owner of washing machines in rural areas has recently produced machines (2011 and later), while in Tbilisi, households usually own machines produced between the years 2001 and 2010. As for washing machine brands, Samsung, Beko and LG were named most frequently.

Figure 42 – Time of Issuing of Washing Machine



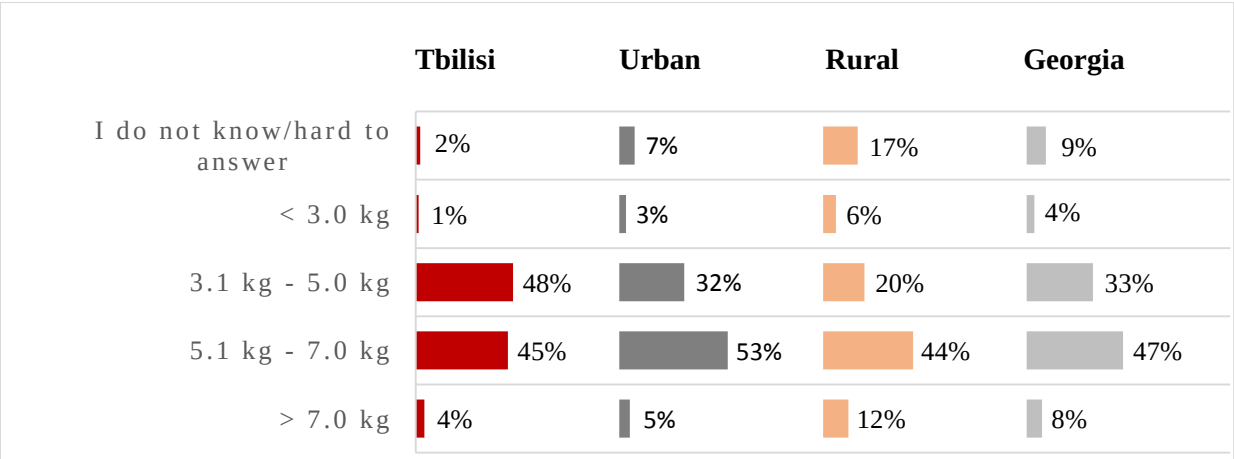
Sample size = 820

Figure 43 – Washing Machine Brands



Sample size = 820

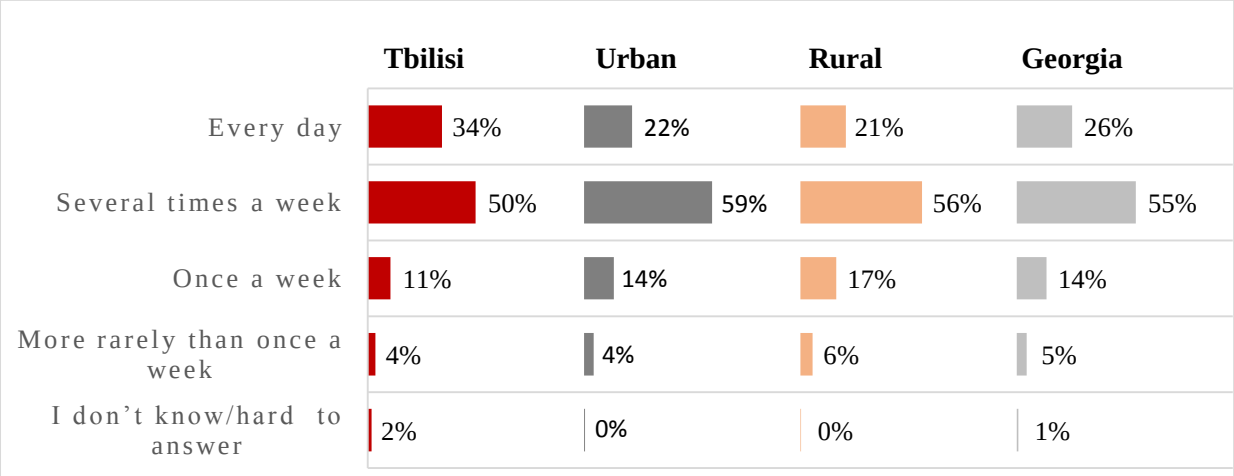
Figure 44 – Size of Washing Machine



Sample size = 820

Based on survey results, households from Tbilisi use washing machines more frequently than households from other localities. In general, an absolute majority of the households uses a washing machine at least once a week.

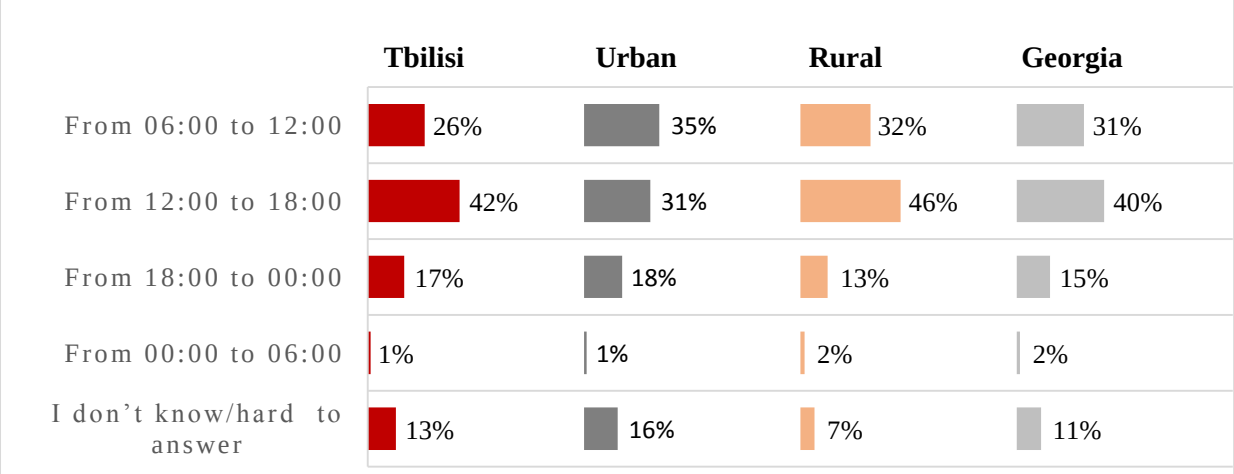
Figure 45 – Frequency of Using Washing Machine



Sample size = 820

The most usual time to use washing machines for Tbilisi and rural residents is the daytime from the hours of 12:00 to 18:00. A different situation is observed among residents outside Tbilisi urban areas, where washing machines are more often used early in the morning.

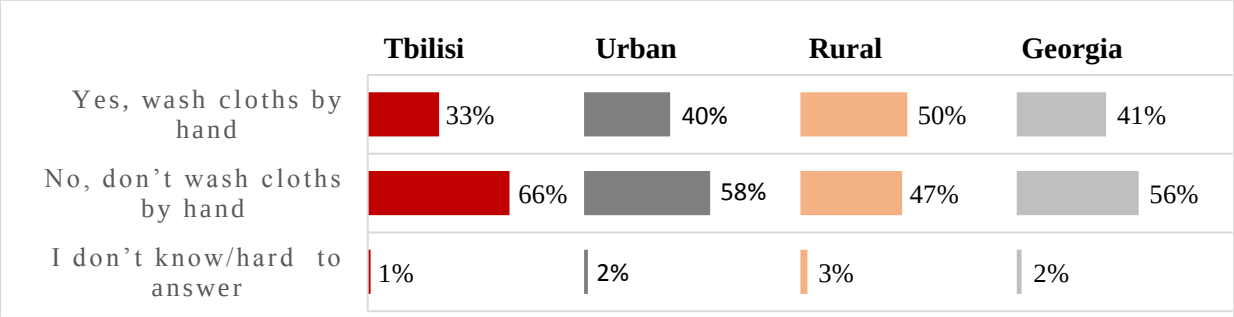
Figure 46 – Time When Washing Machines are Usually Turned On



Sample size = 820

Every third household from Tbilisi washes cloths by hand although they have a washing machine. The share of those practicing hand washing is higher among rural residents – every second respondent reported they do wash cloths by hand parallel to washing by machine.

Figure 47 – Washing Cloths by Hand



Sample size = 820

WASHING MACHINES BY TARGET MUNICIPALITY

A majority of households own washing machines produced after 2001 in all target municipalities, however it should be noted that more residents in Poti town, Zugdidi and Zestafoni municipalities as well as rural areas of Gori, Akhaltsikhe and Telavi own washing machines produced in the last few years - 2011 and later. More residents in Tbilisi, Rustavi, Batumi, Poti, Gori, Zestafoni and Akhaltsikhe towns as well as Zugdidi municipality own Samsung washing machines. In Telavi municipality, Beko is the most frequently owned washing machine brand. LG is the most popular brand of washing machine in Akhaltsikhe and Zestafoni villages, while washing machines produced by Oka are frequently seen in households in rural areas of Gori.

Table 26 – Washing Machine Brands By Target Municipality

Municipalities		Samsung	Beko	LG	Oka
Tbilisi		**23%**	19%	18%	1%
Kutaisi		17%	5%	**41%**	6%
Batumi		**32%**	16%	14%	0.3%
Rustavi		**28%**	12%	19%	1%
Poti		**26%**	5%	16%	11%
Gori	Urban	**42%**	1%	21%	4%
	Rural	27%	3%	15%	**37%**
	TOTAL	34%	2%	18%	22%
Zugdidi	Urban	**47%**	4%	4%	12%
	Rural	**43%**	5%	5%	16%
	TOTAL	45%	4%	4%	14%
Zestafoni	Urban	**17%**	8%	34%	9%
	Rural	15%	6%	**22%**	25%
	TOTAL	16%	6%	27%	19%
Akhaltsikhe	Urban	**31%**	15%	23%	3%
	Rural	21%	12%	**34%**	9%
	TOTAL	27%	14%	28%	6%
Telavi	Urban	25%	**34%**	4%	1%
	Rural	20%	**36%**	9%	9%
	TOTAL	22%	**36%**	7%	6%

Sample size = 3800

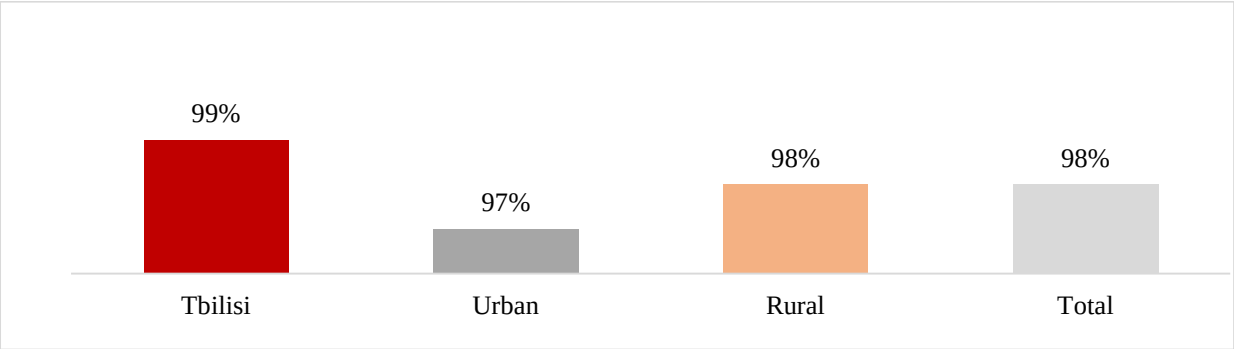
A majority of residents use washing machines several times per week in all target municipalities. A larger share of inhabitants of Kutaisi, Batumi, Rustavi and Telavi municipalities use their washing machines mostly in the morning from 06:00 to 12:00, while residents in other target municipalities preferred washing time is from 12:00 to 18:00.

A majority of the population in rural areas of Gori and Zugdidi wash cloths by hand notwithstanding the fact that they own washing machines as well.

2.3.5 TV Set

A TV set is the most frequently owned home appliance – an absolute majority of the households in all surveyed areas have at least one TV set.

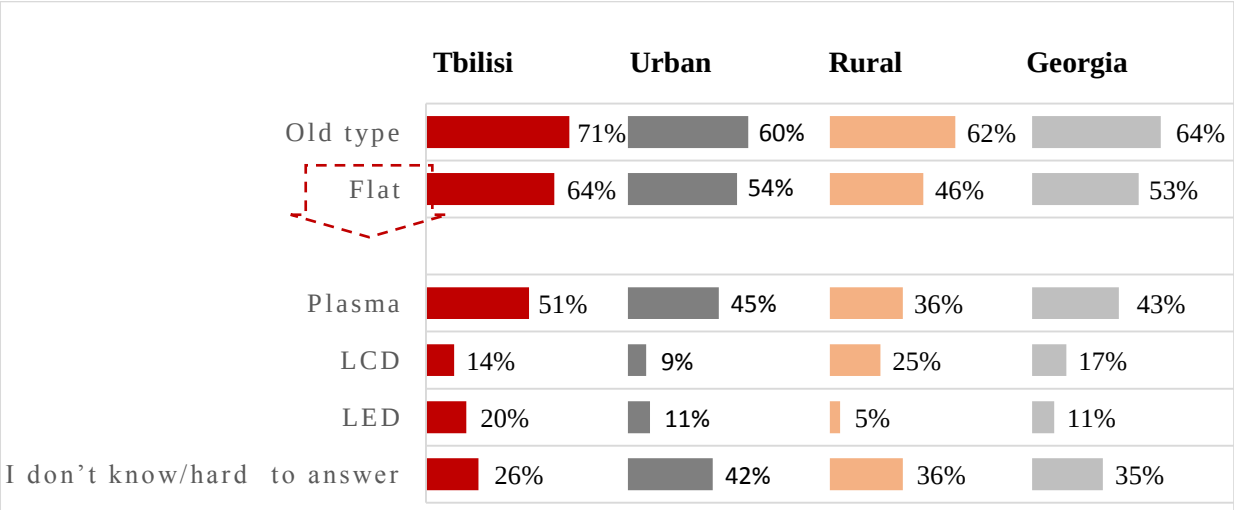
Figure 48 – Ownership of TV Set



Sample size = 1200

A majority of the household own an old type of TV set and among those who own flat screen TV sets, the most common model is the Plasma TV.

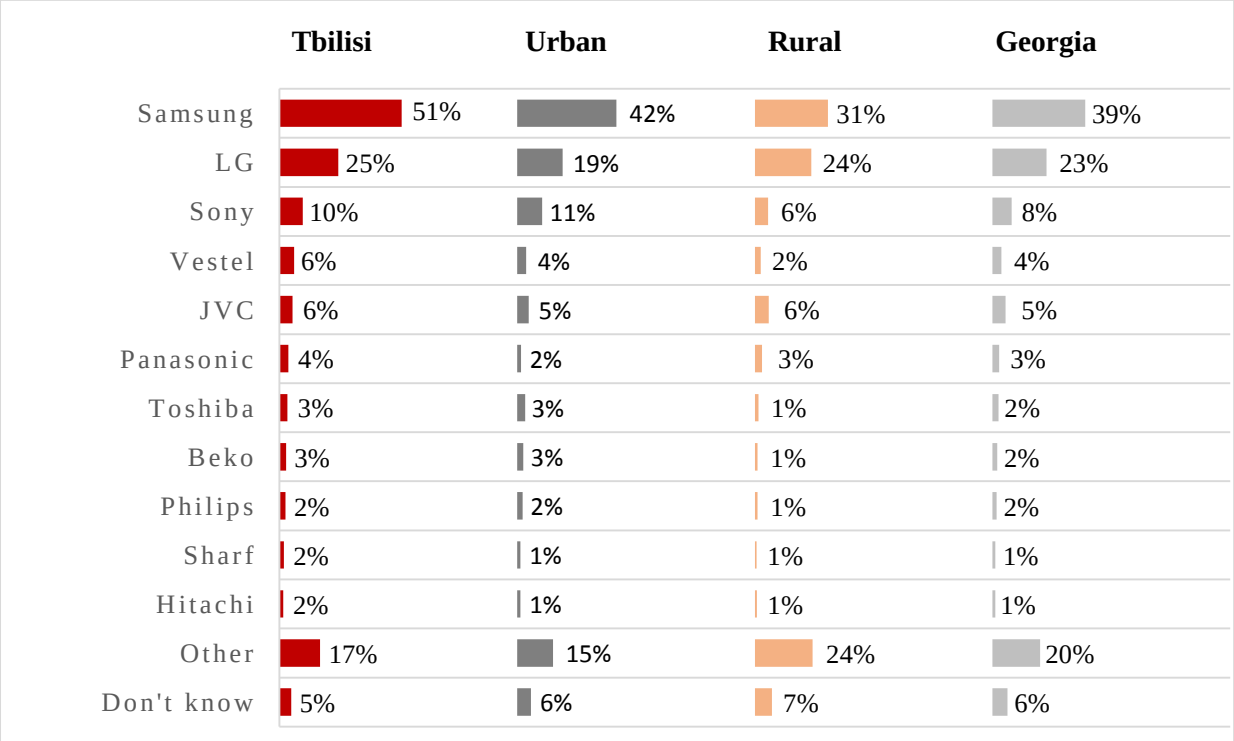
Figure 49 – Characteristics of TV Set



Sample size = 1177

Samsung is the most popular TV brand among Georgian consumers – every second household in Tbilisi owns a TV set of this producer and Samsung is the top brand in all areas as well. Second in the list comes LG, which is owned by about every fourth household. Other brands don't have significant shares as presented, with less than 10 percent of the total population.

Figure 50 – Brand of TV Set



Sample size = 1177

TV SETS BY TARGET MUNICIPALITY

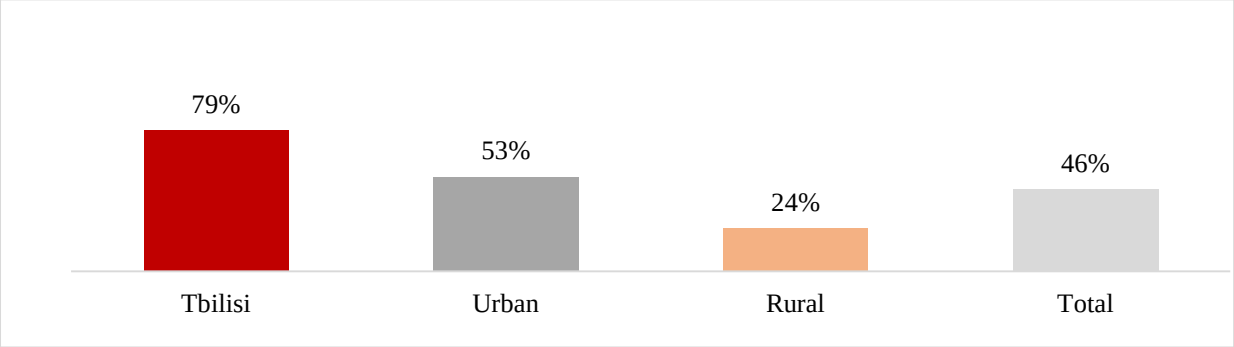
A TV set is the most frequently owned home appliance – an absolute majority of households in all target municipalities own a TV set. However, it is worth mentioning that a majority of residents in targeted rural areas as well as in Poti town own old TV sets. Most inhabitants of Akhaltsikhe and Zugdidi villages who have new TV sets could not define which type they own (Plasma, LCD, LED). A vast majority of respondents in all target municipalities bought their TV sets between the 2001-2010 time period.

The average length of hours when the TV is turned on is almost the same in all target municipalities and is about 7 hours (8 hours in Akhaltsikhe).

2.3.6 Computer

The capital and regions significantly differ in terms of computer ownership: a majority of households from Tbilisi (79 percent) own a computer while the computer ownership rate is quite low in other cities (53 percent) and only every forth household (24 percent) from rural areas owns a computer.

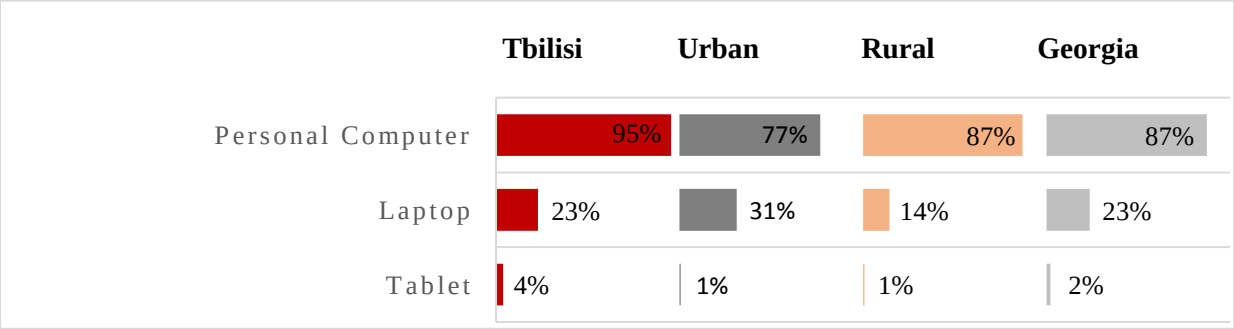
Figure 51 – Ownership of Computer



Sample size = 565

As for the type of computer, most own a personal computer. Tbilisi data shows that a significant share of households have more than one computer and while almost an absolute majority has personal computers, a quite large number of households owns a laptop as well. In other urban and rural areas there are fewer cases with more than one computer.

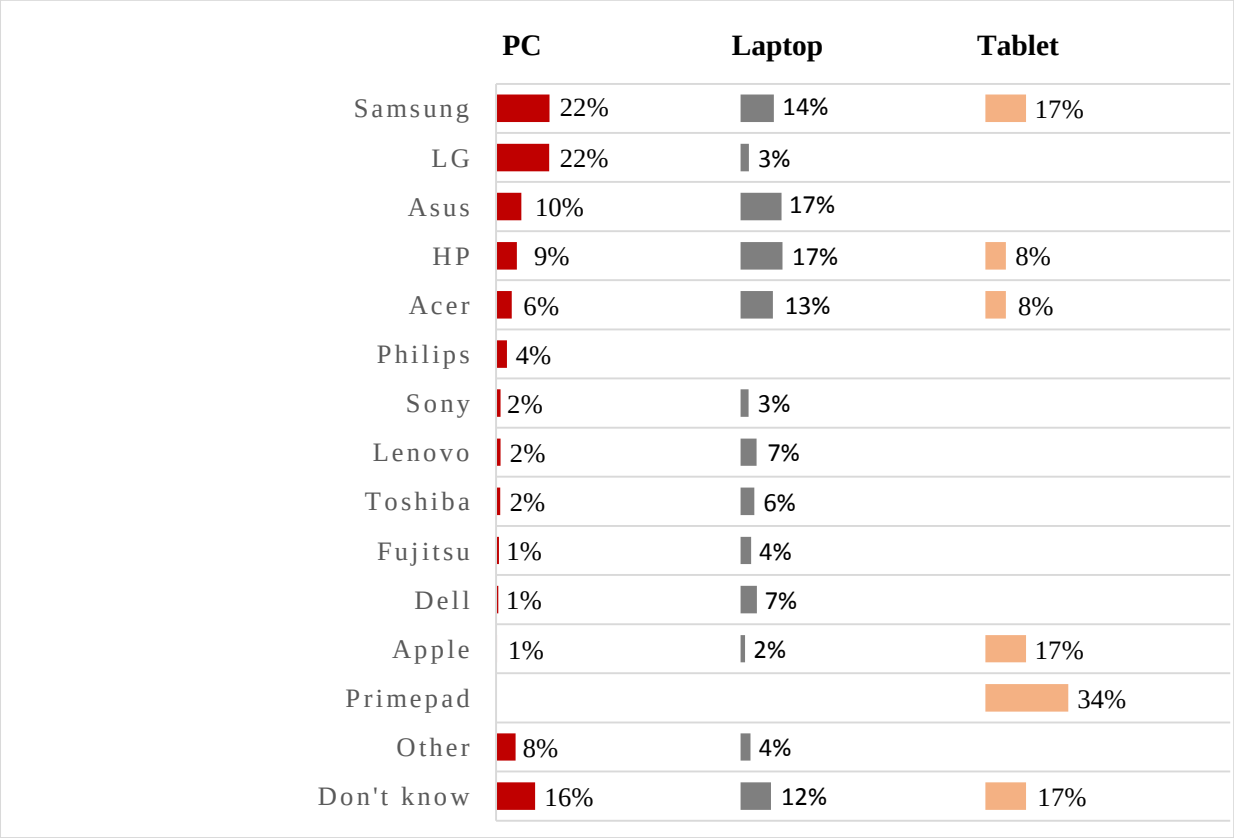
Figure 52 – Computer Types



Sample size = 565

Samsung and LG are the most frequently owned personal computer brands, and Asus and HP lead among laptops. As for tablets, the number of tablet owners is low in the population, and a majority of them own a Prime-pad.

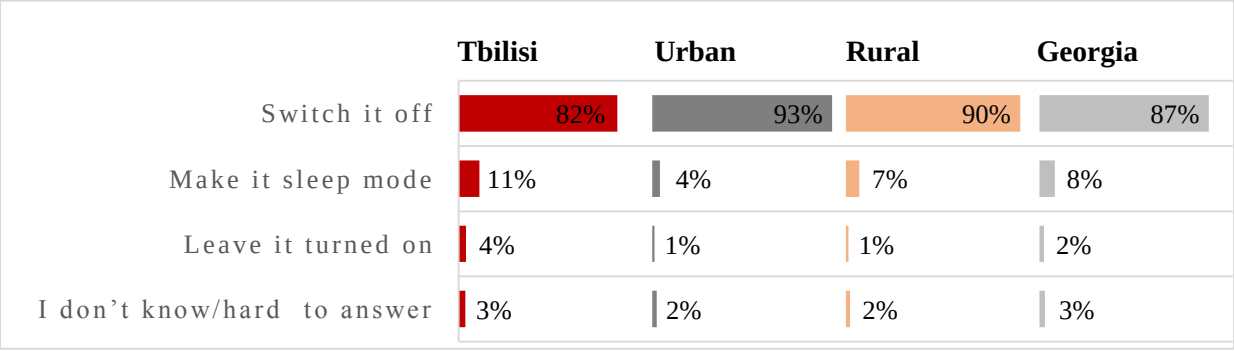
Figure 53 – Computer Brands



Sample size = 565

A majority of computer users switch it off while not working and only a small part uses the sleep mode or leaves it turned on.

Figure 54 – Computer Use Habit while Not Working



Sample size = 565

COMPUTERS/LAPTOPS/TABLETS BY TARGET MUNICIPALITY

A vast majority of Tbilisi inhabitants own computers/laptops/tablets (80 percent). The same figure is quite low in rural areas of targeted municipalities, especially in Gori villages (14 percent).

Most residents of targeted areas who own computers purchased them between the 2007-2011 time period, while most laptop owners bought their laptops after 2012.

The average length of hours when computers/laptops are turned on is six to seven hours. Residents of Zugdidi town spend more time in front of computers and laptops (eight to nine hours), while inhabitants of Zestafoni and Gori towns have computers turned on only for five hours.

Table 27 – Average Length of Hours When Computers/Laptops are Turned On by Target Municipality

Municipalities		COMPUTERS	LAPTOPS
Tbilisi		7	8
Kutaisi		6	7
Batumi		7	7
Rustavi		7	6
Poti		7	4
Gori	Urban	6	7
	Rural	5	0
Zugdidi	Urban	8	9
	Rural	7	6
Zestafoni	Urban	8	6
	Rural	5	5
Akhaltsikhe	Urban	7	7
	Rural	7	6
Telavi	Urban	7	6
	Rural	6	6

Sample size = 3800

A vast majority of residents in all target municipalities switch off their computers/laptops when they are not using them.

2.4 Lighting

The average household in Tbilisi has 10 light bulbs in the home; the average number of bulbs is smaller in other urban areas compared to the capital, and rural residing households have even fewer bulbs on average.

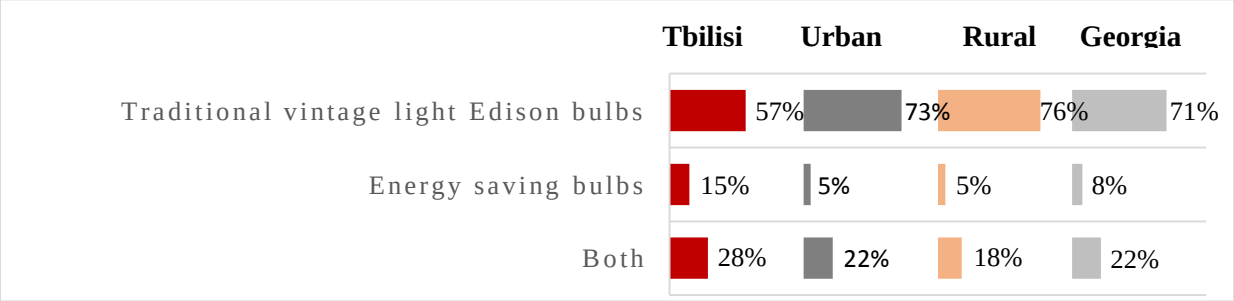
Table 28 – Average Number of Bulbs in the Household

Average number of bulbs in the home	Tbilisi	Urban	Rural	Total
	10	8	7	8

Sample size = 1200

A majority of the surveyed population uses traditional vintage light Edison bulbs. Among Tbilisi households, the share of those who have fully switched to energy saving bulbs is 15 percent, and up to one-third of the households (28 percent) use both types of bulbs. The practice of using energy efficient light bulbs is much weaker among residents of other urban and rural areas. Most respondents that use energy efficient light bulbs find it difficult to name the type of bulbs used.

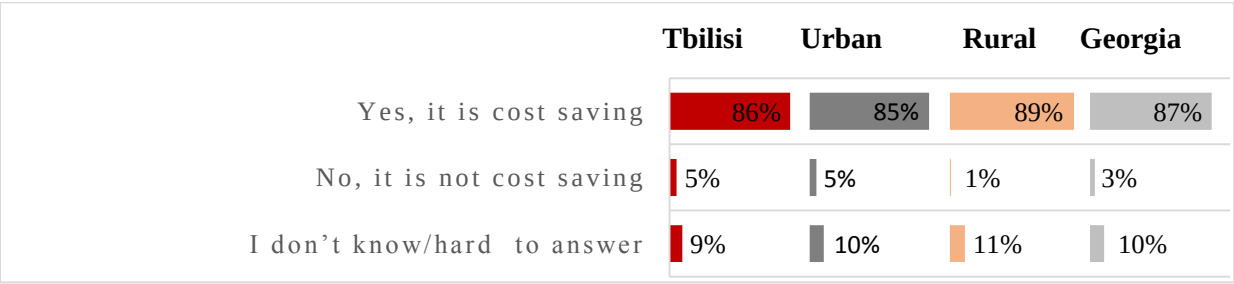
Figure 55 – Type of Bulbs Used



Sample size = 1200

The majority of those who use energy efficient light bulbs consider it cost saving.

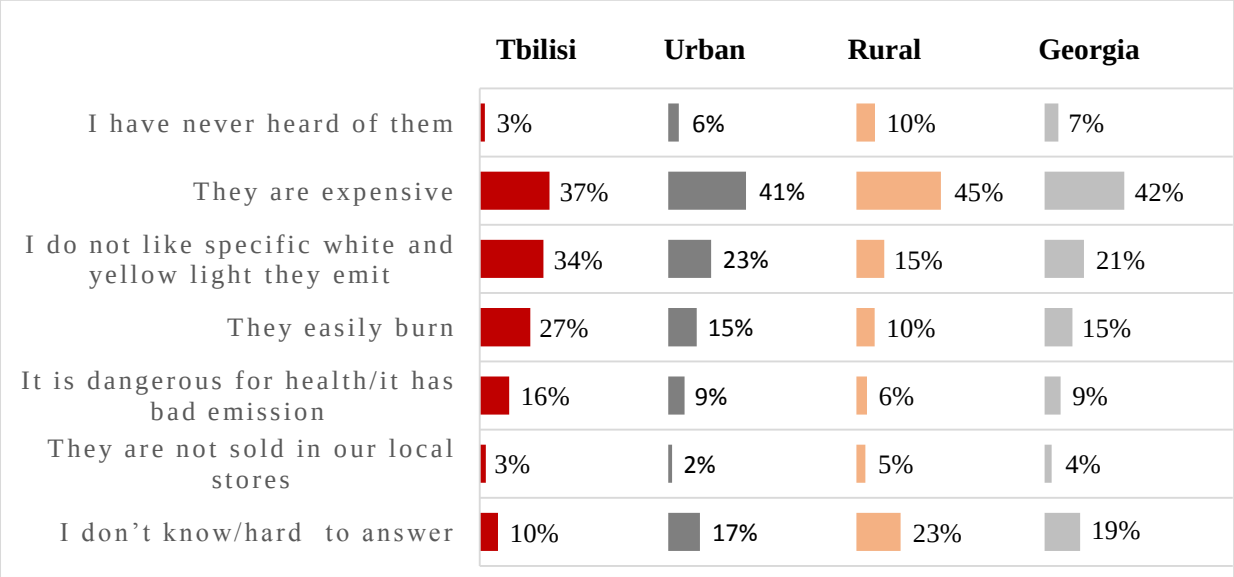
Figure 56 – Evaluating Cost Savings of Energy Efficient Bulbs



Sample size = 357

The main reason for not using energy saving bulbs is the price – people consider energy efficient bulbs expensive. One of the reasons for rejection is that people don't like the specific white or yellow light emitted by energy efficient bulbs. It is interesting that a number of respondents consider this type of light bulb dangerous for health due to emission.

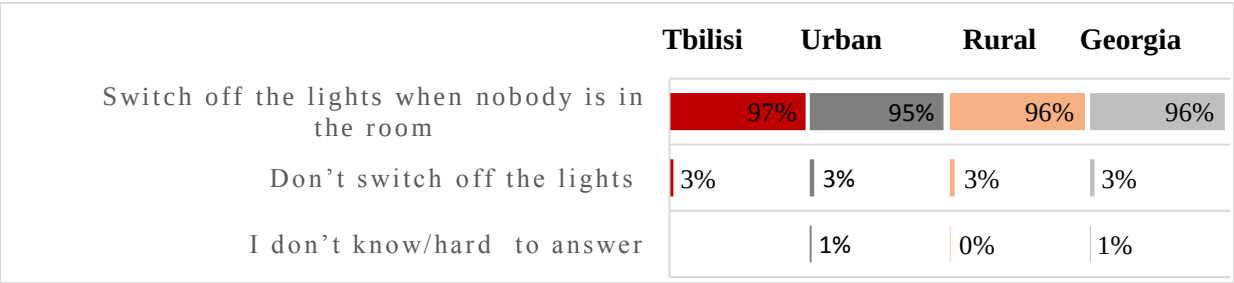
Figure 57 – Reasons for Not Using Energy Efficient Light Bulbs



Sample size = 841

An absolute majority of respondents switch off the lights when nobody is in the room.

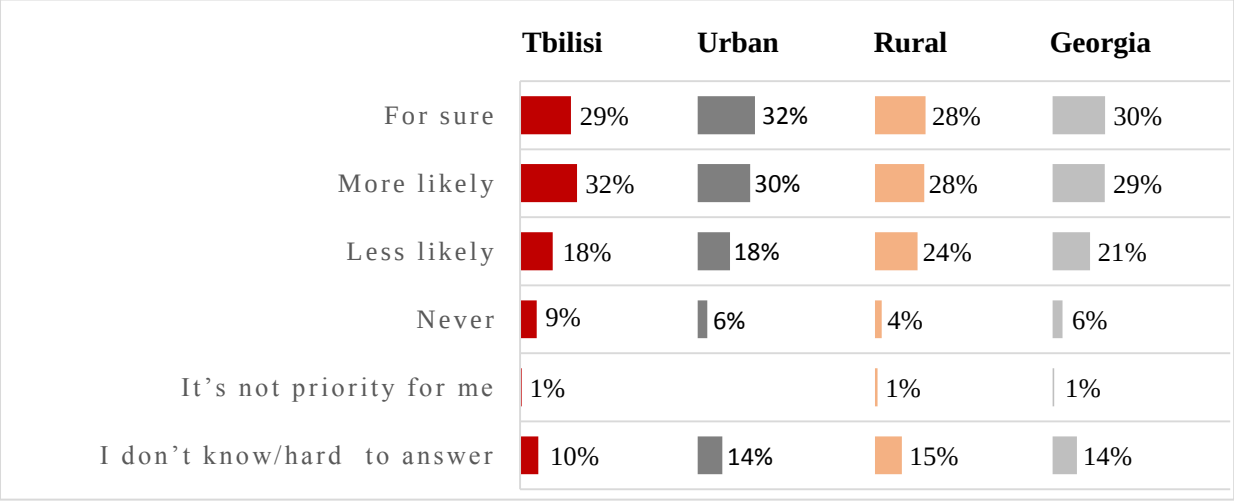
Figure 58 – Lighting Habits



Sample size = 1200

As for the possibility to purchase and use energy efficient light bulbs in the future, respondents express readiness to use efficient bulbs.

Figure 59 – Likelihood of Using Energy Efficient Light Bulbs



Sample size = 1200

LIGHTING BY TARGET MUNICIPALITY

The average household in Tbilisi has 10 light bulbs in the home; the average number of bulbs is smaller in other urban areas compared to the capital, and rural households have even fewer bulbs.

An absolute majority of the population of target municipalities uses electricity for lighting their dwellings. Many of them use traditional vintage light Edison bulbs. The highest share of such residents is represented in Gori and Akhaltsikhe municipalities (80-86 percent). On average, every third or fourth urban resident of target municipalities owns both energy efficient and traditional bulbs. In Gori municipality only eight percent of the population shows the same habit. Those using only energy saving bulbs represent a very small proportion of the surveyed population. The share of such residents is critically low in rural areas of Akhaltsikhe.

Table 29 – Electricity Bulbs by Target Municipality

Municipalities		Traditional vintage light Edison bulbs	Energy saving bulbs	Both
Tbilisi		58%	14%	27%
Kutaisi		63%	**4%**	32%
Batumi		52%	13%	**35%**
Rustavi		65%	11%	25%
Poti		64%	9%	27%
Gori	Urban	84%	**6%**	**10%**
	Rural	87%	**6%**	**7%**
	TOTAL	86%	**6%**	**8%**
Zugdidi	Urban	63%	12%	21%
	Rural	69%	11%	19%
	TOTAL	67%	11%	20%
Zestafoni	Urban	71%	2%	27%
	Rural	69%	5%	26%
	TOTAL	70%	4%	26%
Akhaltsikhe	Urban	57%	9%	**34%**
	Rural	**79%**	**0.5%**	21%
	TOTAL	68%	5%	27%
Telavi	Urban	60%	14%	25%
	Rural	65%	5%	31%
	TOTAL	63%	8%	29%

Sample size = 3800

The main reason for not using energy efficient bulbs is their high price according to a large portion of residents. Their share is especially high in Gori villages (72 percent). Some residents also state that they do not like the specific light of those bulbs and a few inhabitants believe they are easily burned out. Every fifth resident of Rustavi believes such bulbs are dangerous for health.

Table 30 – Reasons for Not Using Energy Efficient Bulbs by Target Municipality

Municipalities		They are expensive	I do not like specific light	They easily burn	Dangerous for health
Tbilisi		36%	31%	26%	14%
Kutaisi		37%	20%	15%	15%
Batumi		31%	23%	9%	6%
Rustavi		44%	**39%**	**25%**	**20%**
Poti		30%	17%	11%	4%
Gori	Urban	62%	12%	14%	3%
	Rural	**72%**	7%	6%	2%
	TOTAL	69%	9%	9%	3%
Zugdidi	Urban	33%	34%	19%	0%
	Rural	36%	13%	11%	2%
	TOTAL	35%	21%	14%	1%
Zestafoni	Urban	36%	23%	12%	15%
	Rural	41%	25%	18%	11%
	TOTAL	39%	24%	16%	13%
Akhaltsikhe	Urban	35%	35%	8%	11%
	Rural	27%	29%	13%	11%
	TOTAL	31%	31%	11%	11%
Telavi	Urban	46%	15%	7%	11%
	Rural	41%	24%	13%	3%
	TOTAL	42%	21%	11%	5%

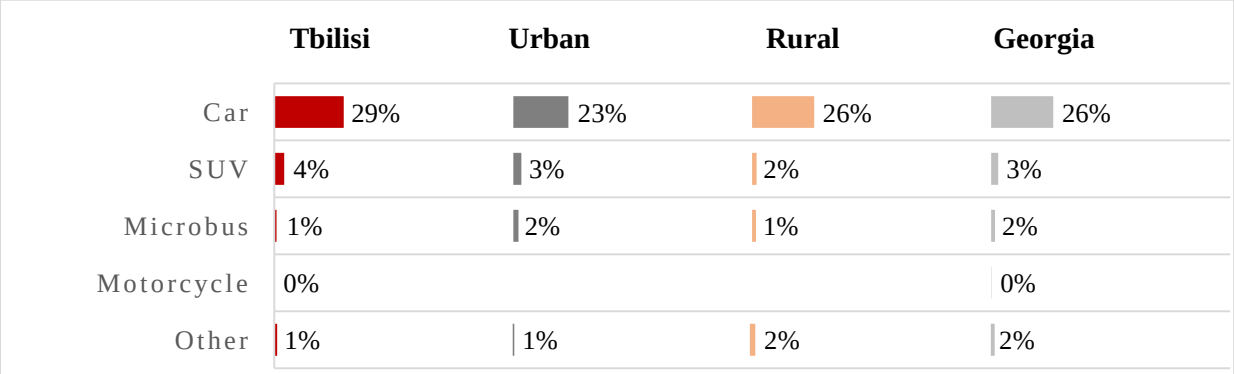
Sample size = 2490

2.5 Transportation

2.5.1 Vehicle Ownership

Every fourth household has at least one vehicle. The vehicle ownership rate is a bit higher among Tbilisi residents compared to other regions. An absolute majority of vehicle owners have cars and the share of those owning an SUV, a microbus, a motorcycle or other truck is very low.

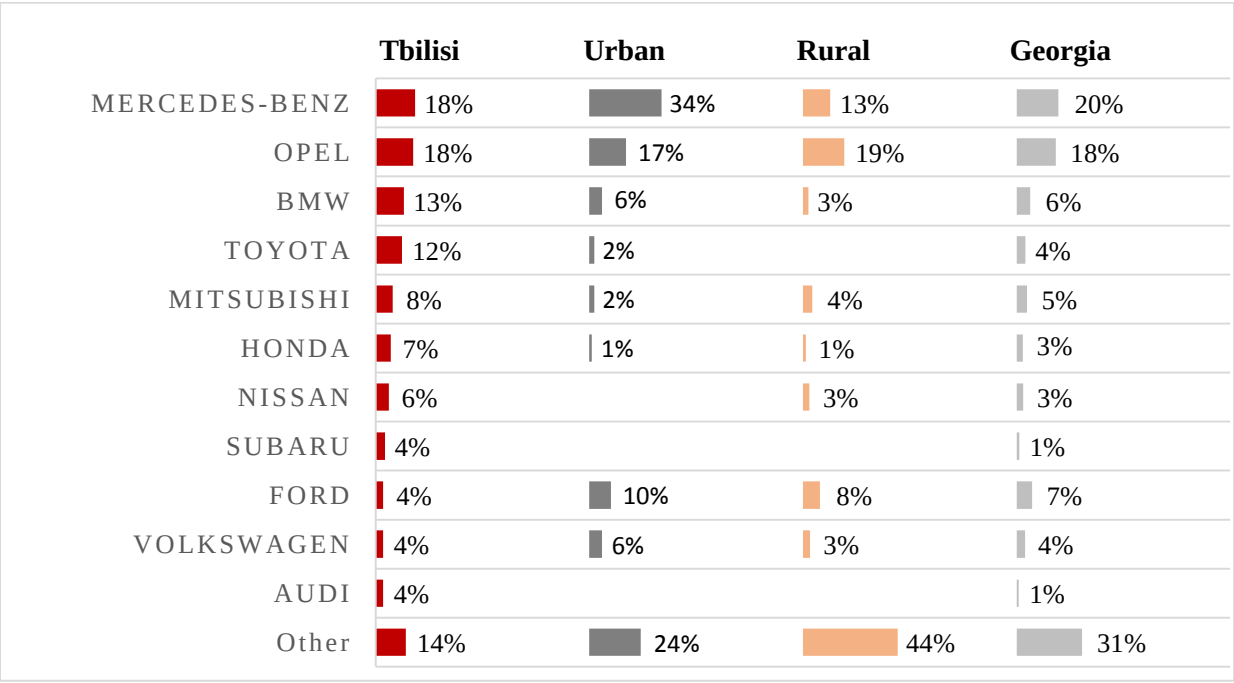
Figure 60 – Vehicle Ownership



Sample size = 1200

Mercedes and Opel are the most frequently owned car brands, but the situation is different across survey target areas. Among Tbilisi car owners, Mercedes and Opel have equal shares followed by BMW. In other urban areas Mercedes is a leader – 34 percent of car owners from outside Tbilisi urban areas have cars from this producer, although Opel is in second place followed by Ford. As for rural areas, Opel holds the leading position followed by Mercedes and Ford.

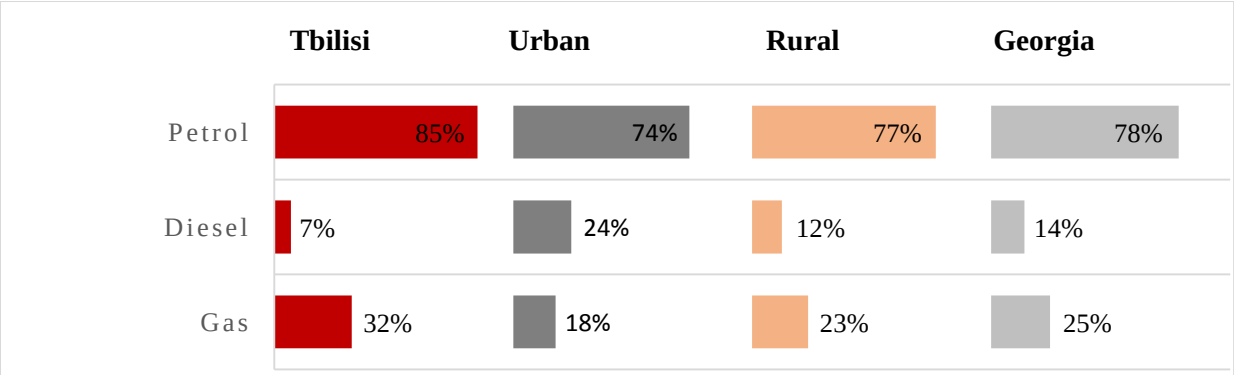
Figure 61 – Car Producers



Sample size = 369

The main type of fuel used is petrol among car owners in all localities; survey data shows that up to one-third of car owners living in Tbilisi use gas parallel to petrol and diesel. The share of gas usage is lower among rural and outside Tbilisi urban area residents. It should be mentioned that diesel usage is higher in regional urban areas.

Figure 62 – Fuel Use



Sample size = 369

More commonly vehicle owners have small size engine cars – 38 percent of them report their car engine size 2 liters and below; also, less of the rural residents own cars with large engines. It is also worth noting that large size car engine do not necessarily mean more fuel consumption per month – all car owners spend below GEL 200 per month on fuel and fuel expenses are higher among Tbilisi residents.

Table 31 – Engine Size and Average Fuel Consumption per Month in GEL

Engine Size	Tbilisi		Urban		Rural		Georgia	
	%	Average fuel cons. Per month in GEL	%	Average fuel cons. Per month in GEL	%	Average fuel cons. Per month in GEL	%	Average fuel cons. Per month in GEL
> 2	37%	181	26%	67	38%	103	38%	117
2-3	28%	159	31%	140	15%	73	15%	124
3<	7%	193	6%	100	3%	74	3%	123
Don't remember	28%		37%		43%		43%	

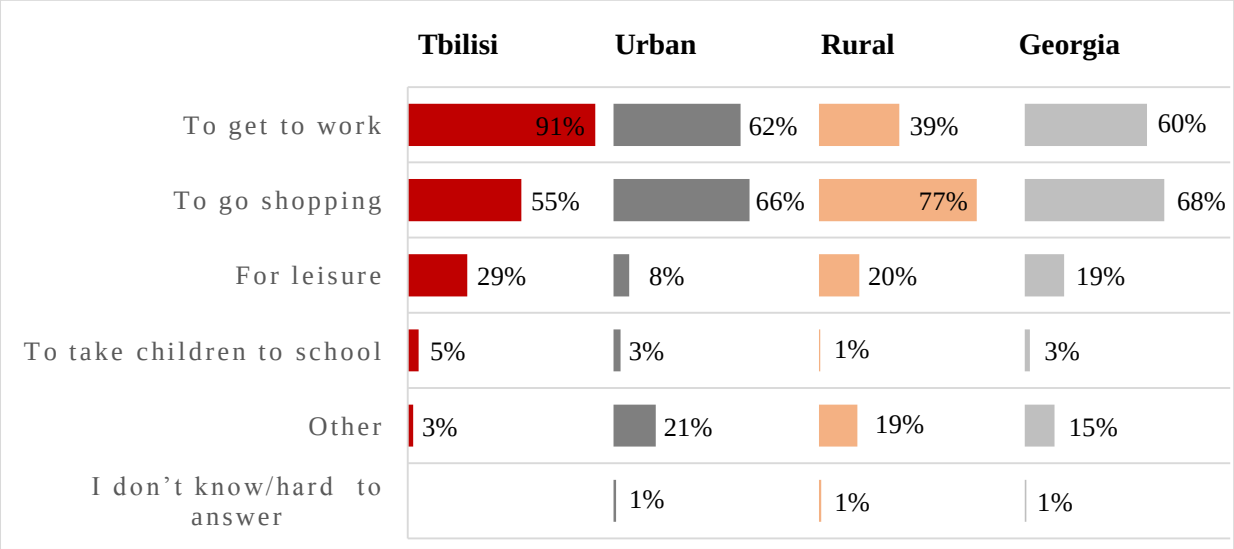
As for the vehicle age, majority of the cars are old, produced before 2000 year and especially in rural areas – 69 percent of the cars in the villages are produces before 2000. In general new cars are quite rare in all areas.

Table 32 – Engine Size

Engine Size	Tbilisi	Urban	Rural
Before 2000 year	57%	53%	69%
2001 - 2005 year	30%	18%	7%
2006 -2010 year	4%	7%	4%
2011 and more	4%	7%	4%
I do not know/hard to answer	25%	22%	25%

Households use cars mainly for two reasons: to get to work and to go shopping. The survey reveals differences among Tbilisi, urban and rural areas: for Tbilisi car owners, the primary purpose of car use is getting to work (91 percent) while in rural areas cars are used mainly for shopping (77 percent). In urban areas outside Tbilisi, cars are used for both purposes with the same frequency.

Figure 63 – Vehicle Use Purposes



Sample size = 369

Considering car use purpose variations across urban and rural areas, car owners living in rural areas travel to urban and rural areas with the same intensity, while Tbilisi residents travel in urban areas mainly.

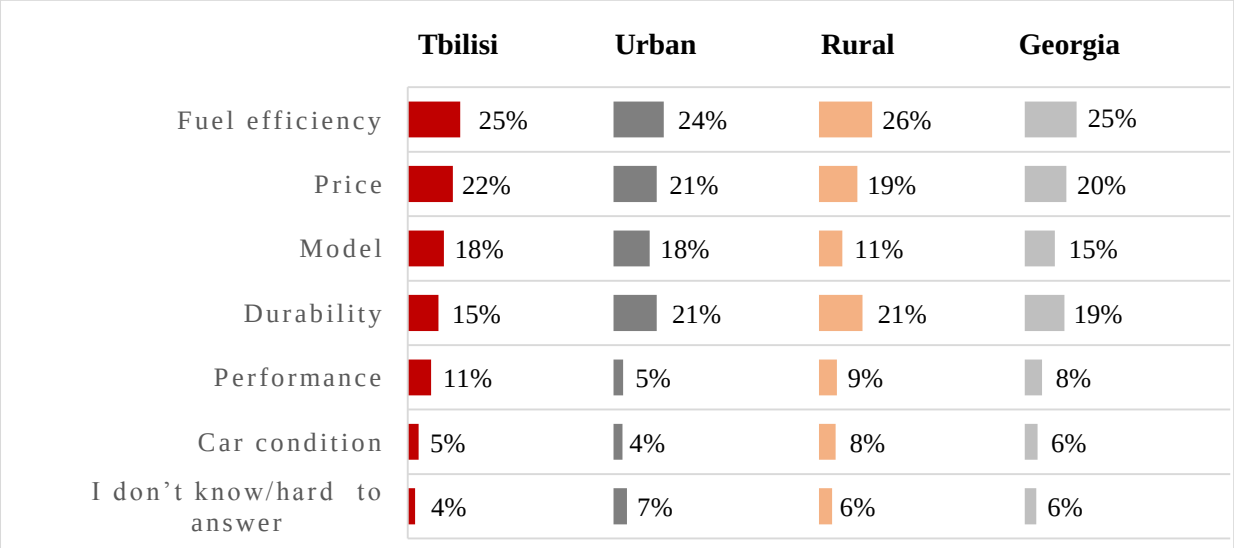
Table 33 – Distribution of Urban-Rural Trips

Urban / Rural	Tbilisi	Urban	Rural	Total
Trips to urban areas	75%	66%	51%	62%
Trips to rural areas	25%	34%	49%	38%

Sample size = 369

When purchasing cars, the main decision-making criteria is fuel efficiency and price - both ae related to expenses. Vehicle durability is an important factor, but rural residents pay more attention to it – the more car owners travel to rural areas, the more they consider vehicle durability. Vehicle model is not considered as much while purchasing the car, although Tbilisi residents pay more attention to this particular factor.

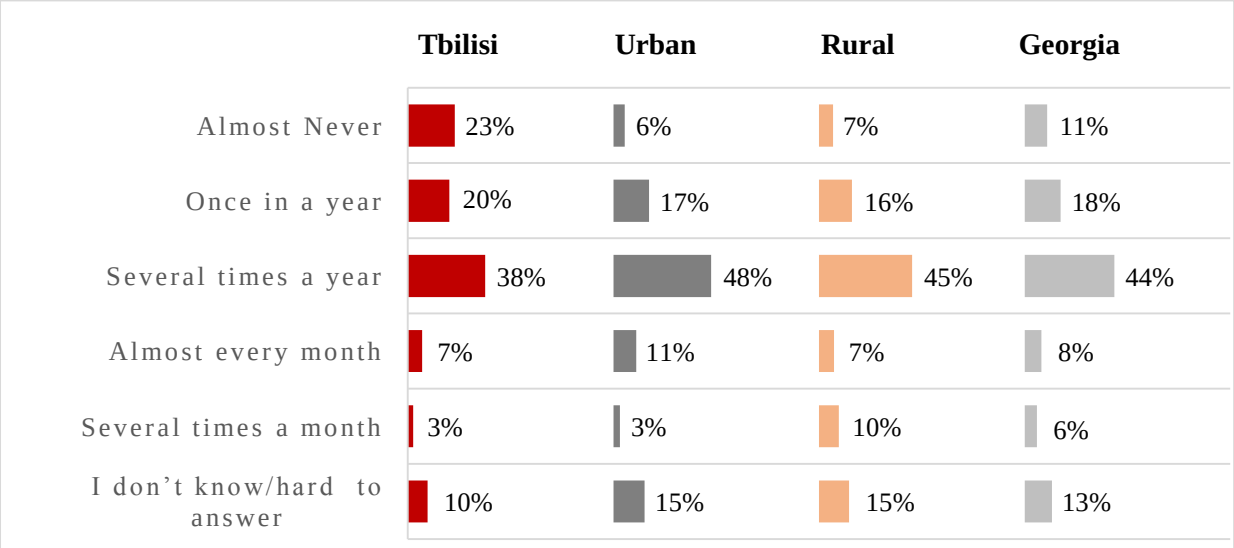
Figure 64 – Car Purchase Preferences



Sample size = 369

As survey results show, the most common practice is to repair the car several times a year. However, as shown in the table below, car owners from Tbilisi repair their vehicle rarely compared to car owners from other localities.

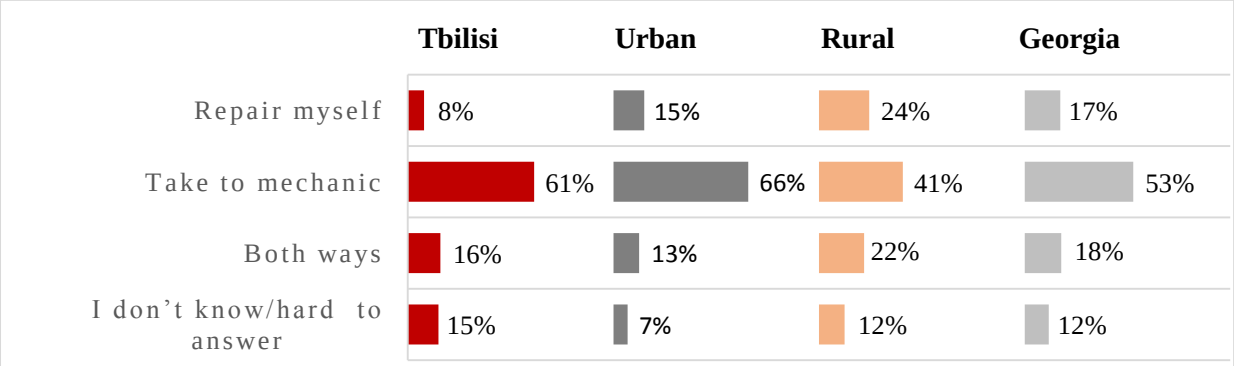
Figure 65 – Car Repair Practice



Sample size = 369

In rural areas, there are more car owners who repair vehicles themselves, but taking the vehicle to a mechanic for repair is the most common practice for car owners in all areas.

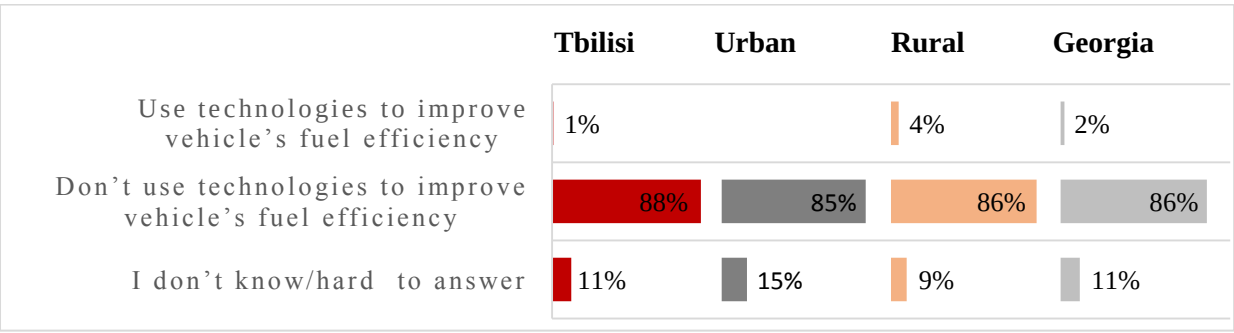
Figure 66 – Method of Car Repair



Sample size = 369

There are very few car owners who report that they undertake any measures, technologies or fuel additives in order to improve their vehicle's fuel efficiency.

Figure 67 – Undertaking Measures to Improve Vehicle's Fuel Efficiency

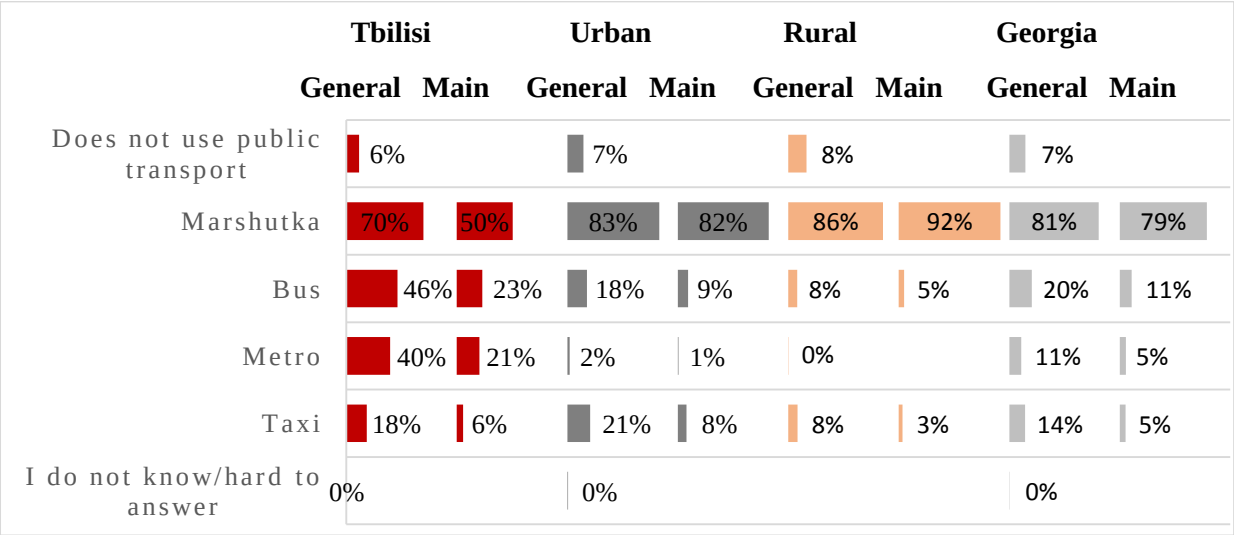


Sample size = 369

2.5.2 Public Transport

Marshutka is the most frequently used public transport means for residents of all areas. Transportation means in the capital are more diverse than in other cities and rural areas: for half of Tbilisi residents (50 percent) Marshutka is the number one public transport, but the rest mainly use a municipal bus and the metro.

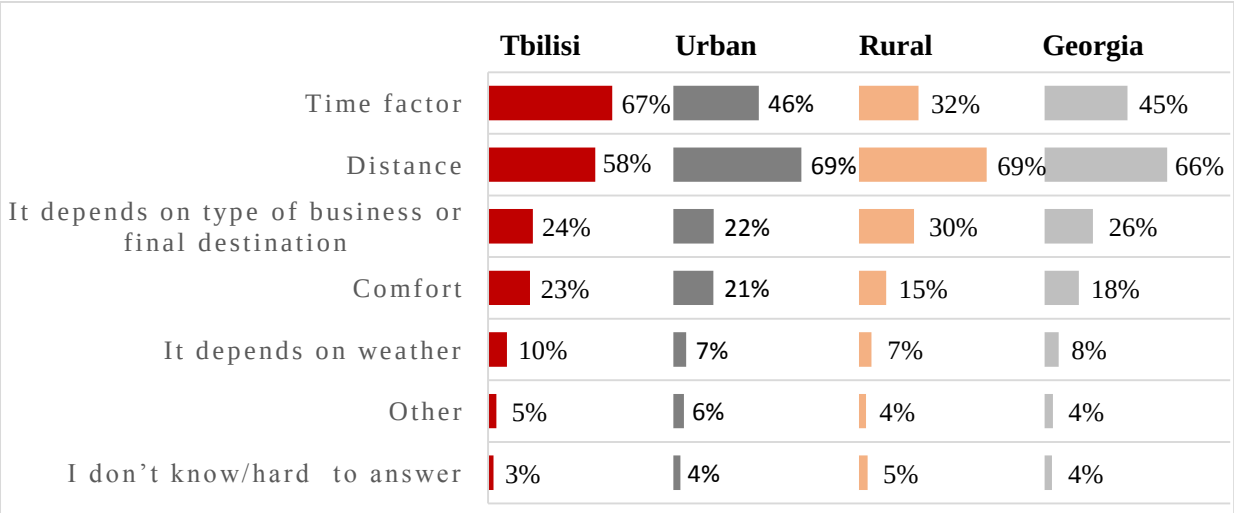
Figure 68 – Use of Public Transport



Sample size = 1200

For Tbilisi residents, time is the main factor in deciding which type of public transport to use. Residents from other urban areas and rural communities pay more attention to distance to be covered during the trip, which is an important factor for Tbilisi residents as well.

Figure 69 – Criteria for Choosing Public Transport Means



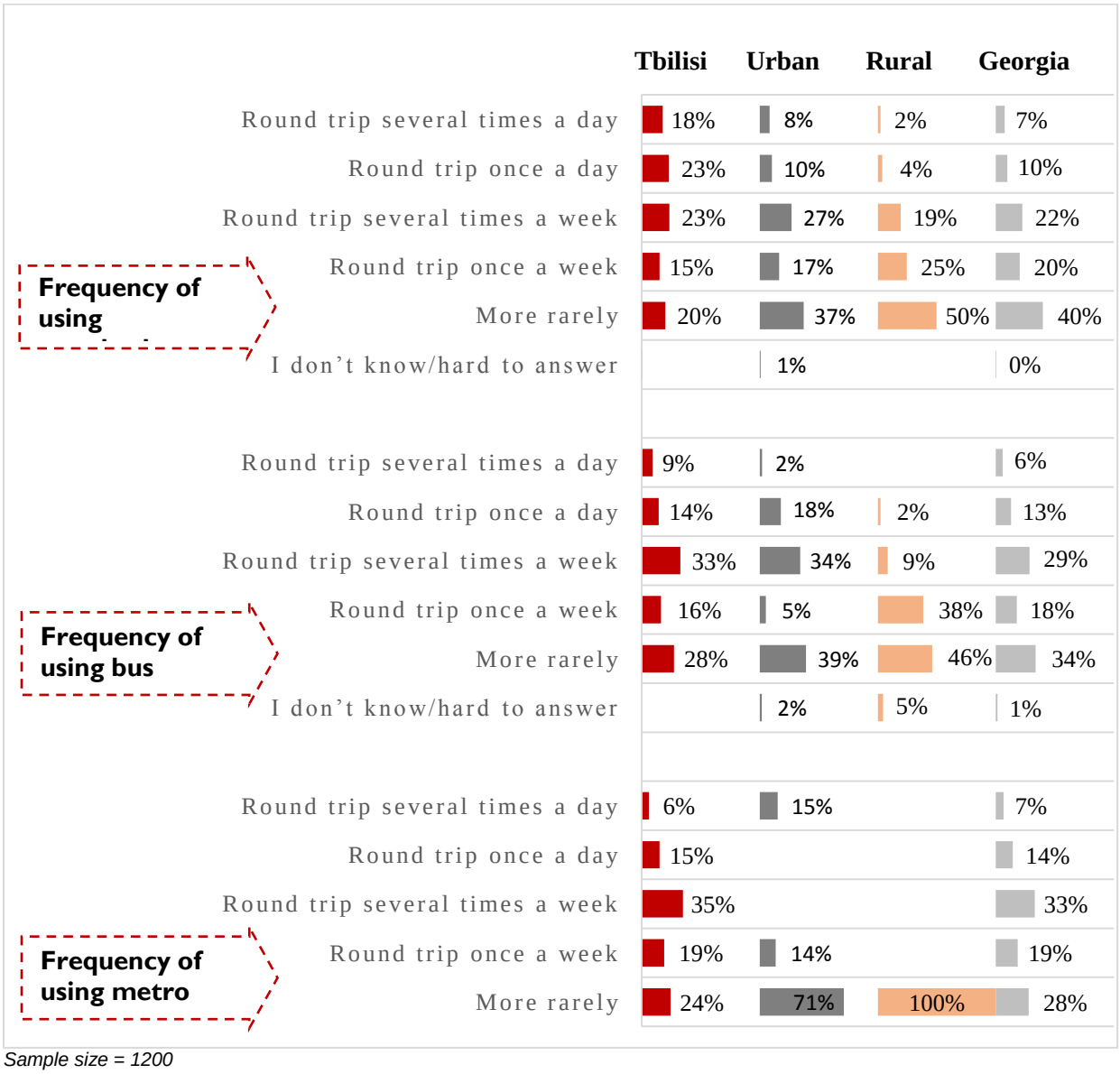
Sample size = 1200

Together with the fact that the marshutka is the primary transport means, analysis of the frequency of use of each transport method shows that more people use a marshutka several times a day when compared to other transport means. In general, the frequency of public transport use is much lower among rural residents when compared to urban residents and especially to the capital.

The average distance covered by the usual round trip by Tbilisi residents varies by transport means: the average round trip made by marshutka and metro is about 18-19 km, while the distance covered by the usual round trip on the bus is smaller.

Rural residents travel greater distance per one round trip as they usually visit municipal centers or other communities. As the survey shows, rural residents choose marshutka for longer trips.

Figure 70 Frequency of Use of Different Transport Means



Sample size = 1200

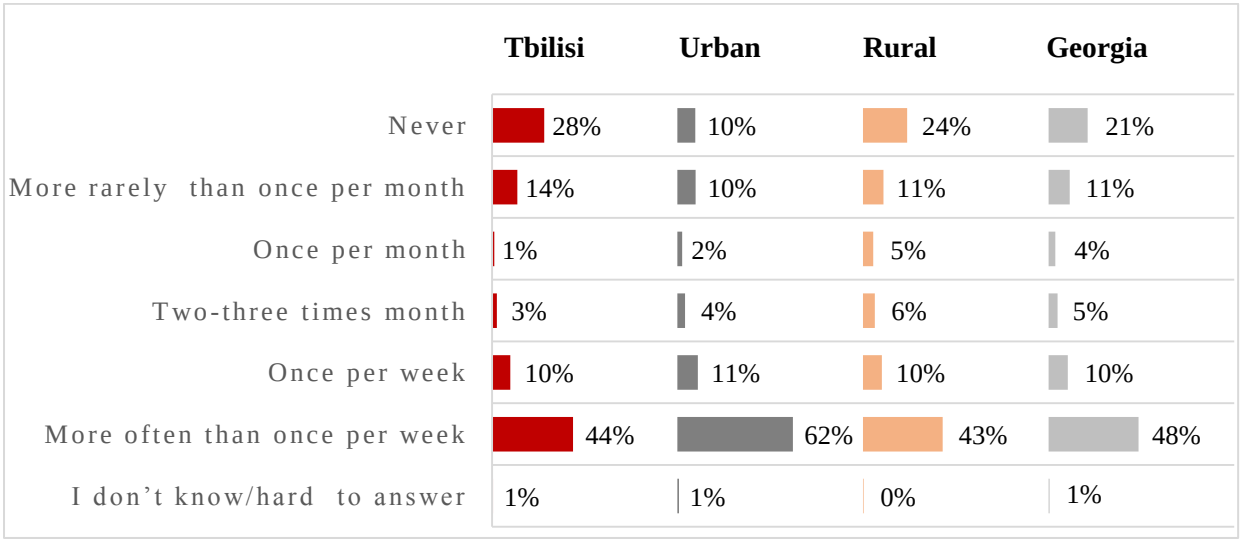
Table 34 – Average Distance Covered per Regular Trip (in km)

Transportation means	Tbilisi	Urban	Rural	Total
Average kilometers covered per regular trip on Marshutka	18.19	19.72	47.60	34.03
Average kilometers covered per regular trip on Bus	14.17	17.30	26.23	17.44
Average kilometers covered per regular trip on Metro	18.63	-	-.	19.39
Average kilometers covered per regular trip on Taxi	16.84	10.47	26.78	18.13

Sample size = 1200

More than every forth respondent (28 percent) form Tbilisi never walks to any appointment, while walking to work, to a shop or to any other location is the most common for residents of other urban areas. In general, the number of those who walk to appointments more often than once a week is quite high in all surveyed areas (Tbilisi – 44 percent; other urban areas – 62 percent; rural areas – 43 percent).

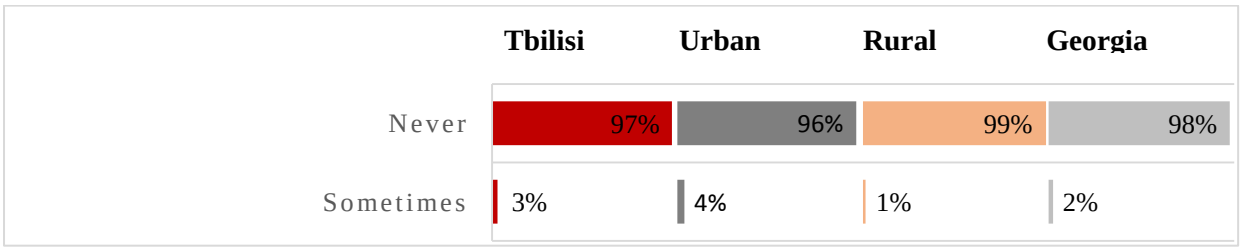
Figure 71 – Walk to Work, Shop or Any Appointment



Sample size = 1200

As the survey shows, there are very few respondents who use a bike as a transportation means.

Figure 72 – Bicycing Habits



Sample size = 1200

TRANSPORTATION BY TARGET MUNICIPALITY

Price is the leading car selection factor in all target municipalities. Almost one-third of residents in Zugdidi and Zestafoni municipalities name fuel efficiency as the main criterion for choosing a vehicle. Model is also an important factor for Zestafoni town residents.

Table 35 – Car Purchase Preferences by Target Municipality

Municipalities		Price	Model	Performance	Durability	Fuel Efficiency
Tbilisi		23%	16%	15%	14%	24%
Kutaisi		13%	16%	5%	8%	38%
Batumi		18%	18%	6%	10%	14%
Rustavi		24%	12%	7%	15%	21%
Poti		25%	21%	8%	5%	28%
Gori	Urban	38%	14%	5%	22%	3%
	Rural	69%	11%	6%	4%	2%
	TOTAL	**56%**	12%	6%	11%	2%
Zugdidi	Urban	13%	5%	5%	10%	43%
	Rural	8%	18%	8%	3%	28%
	TOTAL	10%	13%	7%	6%	**34%**
Zestafoni	Urban	19%	**29%**	12%	0.0%	**36%**
	Rural	15%	13%	4%	12%	26%
	TOTAL	17%	18%	7%	7%	**29%**
Akhaltsikhe	Urban	23%	23%	0.0%	13%	16%
	Rural	20%	20%	10%	38%	5%
	TOTAL	22%	**22%**	5%	26%	11%
Telavi	Urban	20%	15%	6%	18%	16%
	Rural	44%	5%	5%	21%	20%
	TOTAL	37%	8%	5%	20%	19%

Sample size = 3800

Almost no residents of target municipalities use technologies, fuel additives or other actions to improve their vehicle's fuel efficiency.

A vast majority of respondents of target municipalities state that they and their relatives use mini buses (marshutkas) as public transport. Half of Tbilisi and Kutaisi inhabitants also use public buses. The metro is used only by Tbilisi residents.

Table 36 – Usage of Public Transport by Target Municipality

Municipalities		Marshutka		Bus	
		Respondent	Other	Respondent	Other
Tbilisi		70%	**51%**	73%	**52%**
Kutaisi		89%	**53%**	90%	**48%**
Batumi		76%	41%	76%	41%
Rustavi		81%	42%	84%	33%
Poti		88%	3%	88%	3%
Gori	Urban	82%	4%	82%	3%
	Rural	79%	28%	82%	25%
	TOTAL	80%	20%	82%	17%
Zugdidi	Urban	71%	33%	71%	32%
	Rural	93%	6%	94%	8%
	TOTAL	84%	16%	85%	17%
Zestafoni	Urban	92%	20%	93%	18%
	Rural	96%	7%	94%	6%
	TOTAL	95%	11%	94%	10%
Akhaltsikhe	Urban	73%	13%	67%	10%
	Rural	85%	8%	82%	5%
	TOTAL	79%	10%	74%	7%
Telavi	Urban	45%	1%	46%	0.0%
	Rural	79%	0.4%	82%	1%
	TOTAL	69%	1%	72%	1%

Sample size = 3800

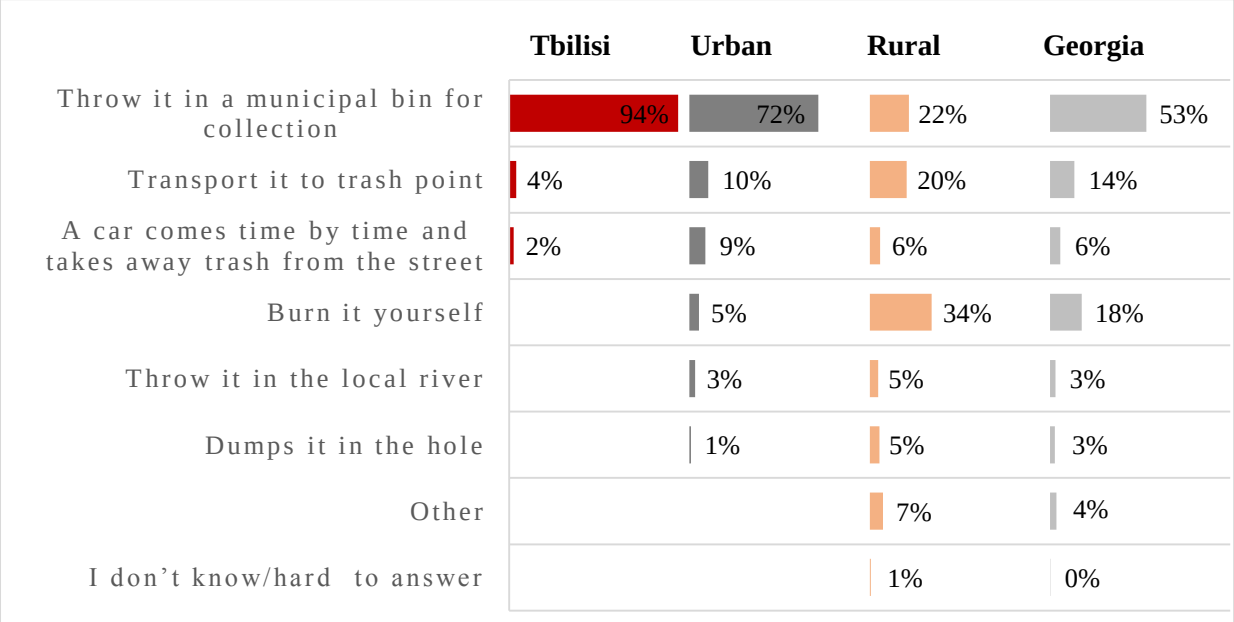
A vast majority of residents in Rustavi, Poti and Zestafoni towns state that they walk to work, to a shop or to other appointments more often than once per week. The smallest share of inhabitants in Akhaltsikhe villages has the same habit according to study results (18 percent). Every third resident in Tbilisi and rural areas of Zestafoni say that they never walk to work, a shop or an appointment. Almost nobody uses a bike for such cases in any target municipality.

Distance is considered an important selection factor in deciding which transportation form to use in all rural areas of target municipalities. The share of such residents is especially high in Gori and Zestafoni villages (88 percent). Time is named as an important factor by a majority of Tbilisi and Gori urban inhabitants.

2.6 Waste Management and Collection

Waste disposal methods differ between urban and rural locations. While the absolute majority of Tbilisi residents throw trash in a municipal bin for collection, any kind of municipal services are hardly accessible for the majority of rural residents – the most common way of waste disposal among rural residents is burning. It is noteworthy that part of the rural residents used to throw waste in a river or dump in a hole.

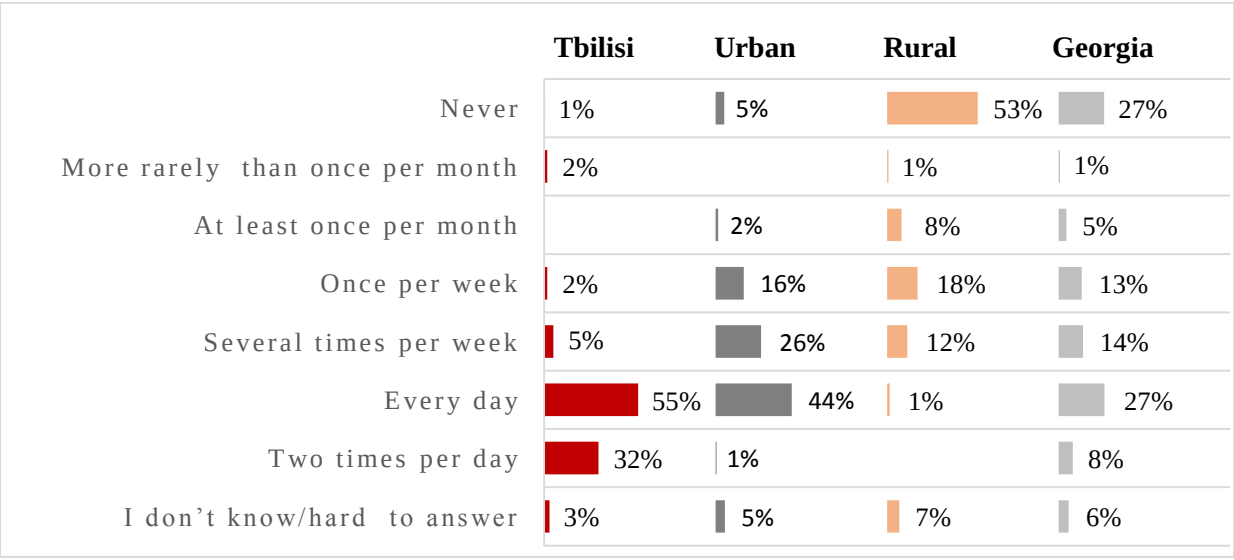
Figure 73 – Waste Disposal



Sample size = 1200

Tbilisi residents report that a municipal trash removal service collects waste on a daily basis (87 percent). About a third of respondents form Tbilisi say that trucks come even twice a day. Municipal trash removal services are not available at all for half of rural residents.

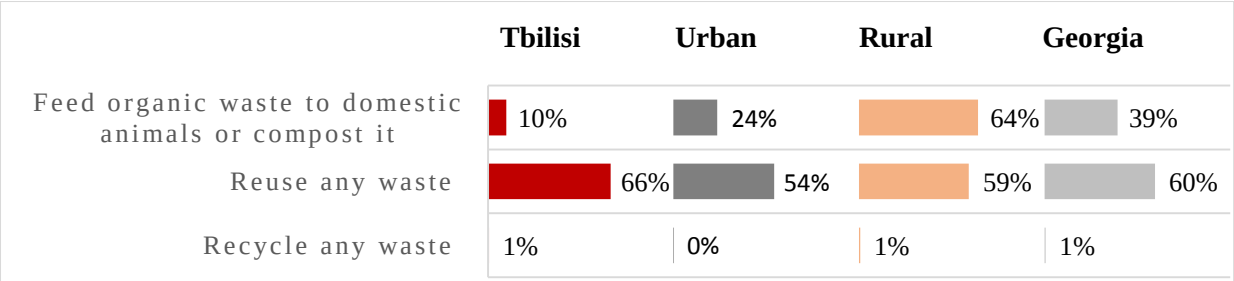
Figure 74 – Frequency of Trash Removal



Sample size = 1200

Waste recycling is not a common practice at all, but a significant part of respondents in all locations report that they re-use some waste. Using organic waste for animal feeding is quite common among rural residents, and a number of urban residents state that they use organic waste.

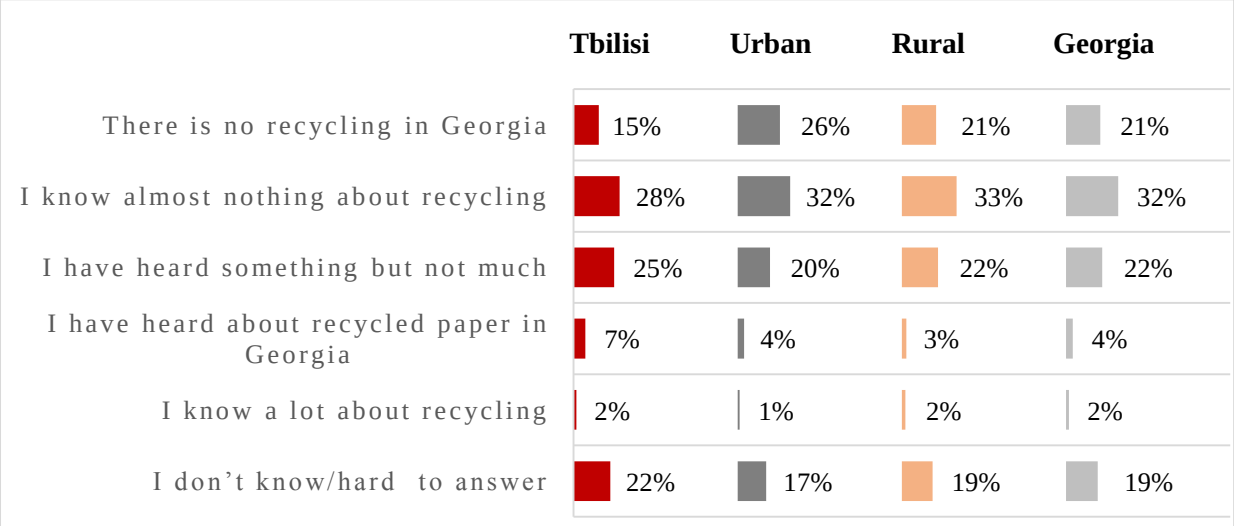
Figure 75 – Waste Reuse and Recycling



Sample size = 1200

Respondents don't consider themselves to be well aware of recycling in Georgia – a majority of the residents from all locations report they have heard nothing about recycling or have heard something, not ensuring their knowledge in this topic.

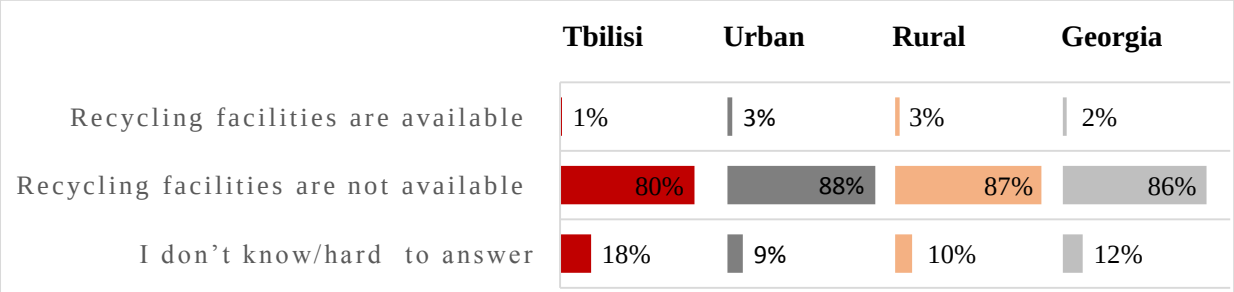
Figure 76 – Awareness of Recycling Process



Sample size = 1200

Only very few respondents state that recycling facilities are available for them: a majority say that they don't have access to this type of facility or that they don't know about it at all.

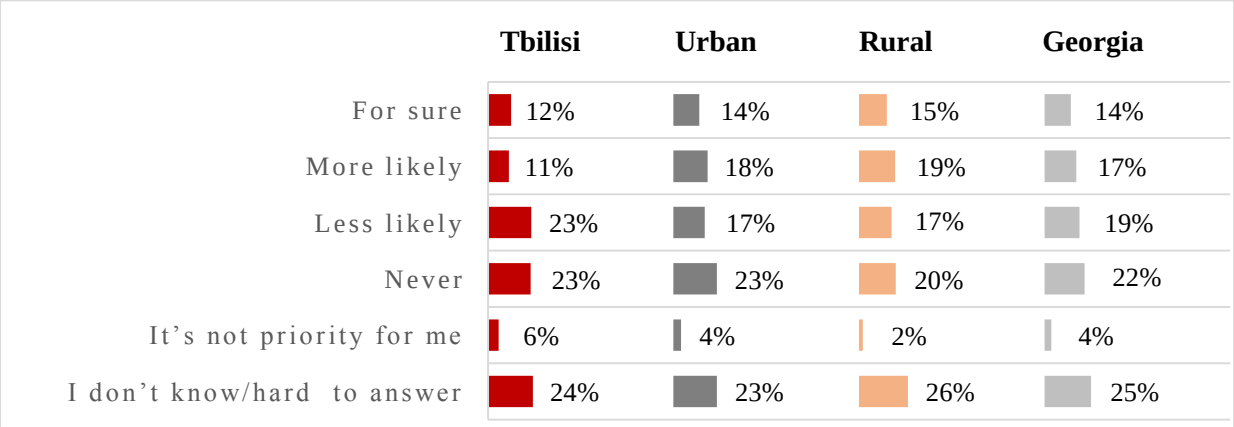
Figure 77 – Availability of Recycling Facilities



Sample size = 1200

If recycling facilities were available, part of the respondents express readiness to use it, but still, a majority of respondents are not sure they would do so or find it difficult to provide an answer.

Figure 78 – Likelihood of Using Recycling Facilities if they are Available



Sample size = 1200

WASTE MANAGEMENT AND COLLECTION BY TARGET MUNICIPALITY

Waste disposal ways differ for urban and rural locations by municipality. While the absolute majority of Tbilisi, Kutaisi, Batumi, Zugdidi, Zestafoni and Poti residents throw trash in a municipal bin for collection, ways of waste disposal vary by urban and rural areas in other target municipalities. The most common method of waste disposal among rural residents of Zestafoni is burning. Half of Rustavi citizens throw trash in municipal bins, while another half has to transport it to a trash point. In Gori villages, people either burn their trash or throw it in the local river. The most common ways of trash disposal in Zugdidi rural areas are burning or dumping in a hole. Half of the residents in Akhaltsikhe urban areas use municipal bins, while another half has to wait for a car that arrives time by time and collects trash from their streets. A majority of Telavi town inhabitants must wait for such cars as well. It is noteworthy that part of Akhaltsikhe rural residents burn their trash, another part transport it to the trash points and some throw trash in the local river.

Table 37- Waste Disposal by Target Municipality

Municipalities		Throw it in a municipal bin	Burn it	Transport it to trash point	Throw it in the local river	A car comes time by time	Dumps it in a hole
Tbilisi		**95%**	0.0%	3%	0.0%	2%	0.0%
Kutaisi		**84%**	1%	1%	1%	13%	0.0%
Batumi		**90%**	0%	8%	0%	1%	0.0%
Rustavi		**55%**	0%	**45%**	0%	0%	0.0%
Poti		**74%**	1%	2%	0%	22%	0.3%
Gori	Urban	**62%**	0%	11%	0%	**28%**	0.0%
	Rural	16%	**29%**	16%	**23%**	2%	1%
	TOTAL	31%	19%	14%	15%	11%	1%
Zugdidi	Urban	**90%**	7%	2%	0%	0%	1%
	Rural	26%	**38%**	9%	1%	0%	**23%**
	TOTAL	51%	26%	6%	1%	0%	14%
Zestafoni	Urban	**73%**	3%	9%	5%	10%	0.0%
	Rural	5%	**64%**	22%	7%	0%	0.0%
	TOTAL	29%	43%	18%	6%	4%	0.0%
Akhaltsikhe	Urban	**47%**	1%	16%	2%	**34%**	0.0%
	Rural	2%	**40%**	**34%**	**12%**	4%	1%
	TOTAL	24%	20%	25%	7%	19%	1%
Telavi	Urban	16%	0%	22%	1%	**61%**	0.0%
	Rural	1%	7%	**54%**	**12%**	19%	0.4%
	TOTAL	6%	5%	44%	9%	32%	0.3%

Sample size = 3800

A majority of Tbilisi, Kutaisi, Batumi, Zestafoni and Poti residents report that municipal trash removal service collects waste on a daily basis, while a vast majority in Gori and Zetsafoni villages report that it never happens there.

Waste recycling is not a common practice at all, but a majority of residents in Telavi and Zugdidi villages as well as most residents in Kutaisi and Rustavi cities report they re-use

some waste. A vast majority in Akhaltsikhe and Zestafoni rural areas commonly use organic waste for animal feeding.

A majority of respondents either do not consider themselves to be aware of recycling in Georgia or think that there is no recycling in Georgia at all. More than one-third of the population in Zestafoni villages as well as in Telavi town report that they have heard something but not much about recycling in Georgia.

If recycling facilities were available, almost half of the respondents in Telavi villages express readiness to use it.

Table 38 - Awareness of Recycling in Georgia by Target Municipality

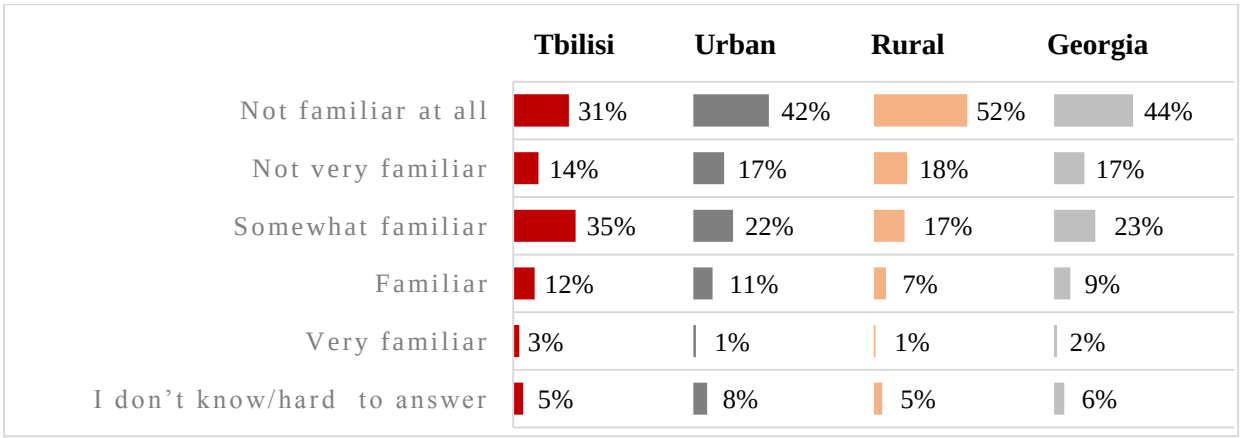
Municipalities		There is no recycling in Georgia	Know Nothing /Don't Know	I have heard something	I have heard about recycled paper	I know a lot about recycling
Tbilisi		17%	48%	26%	7%	2%
Kutaisi		28%	36%	30%	2%	4%
Batumi		20%	63%	13%	3%	1%
Rustavi		15%	43%	31%	10%	2%
Poti		23%	54%	16%	1%	5%
Gori	Urban	19%	46%	32%	2%	1%
	Rural	17%	70%	11%	2%	0.0%
	TOTAL	18%	62%	18%	2%	0.3%
Zugdidi	Urban	34%	46%	16%	3%	1%
	Rural	21%	61%	15%	1%	2%
	TOTAL	26%	55%	15%	2%	2%
Zestafoni	Urban	38%	33%	25%	0.0%	5%
	Rural	22%	31%	**38%**	4%	5%
	TOTAL	27%	32%	34%	2%	5%
Akhaltsikhe	Urban	23%	54%	19%	3%	1%
	Rural	11%	66%	23%	0.0%	0.0%
	TOTAL	17%	60%	21%	2%	0.3%
Telavi	Urban	4%	55%	**36%**	1%	4%
	Rural	13%	58%	26%	1%	2%
	TOTAL	10%	57%	29%	1%	3%

Sample size = 3800

2.7 General Energy Efficiency

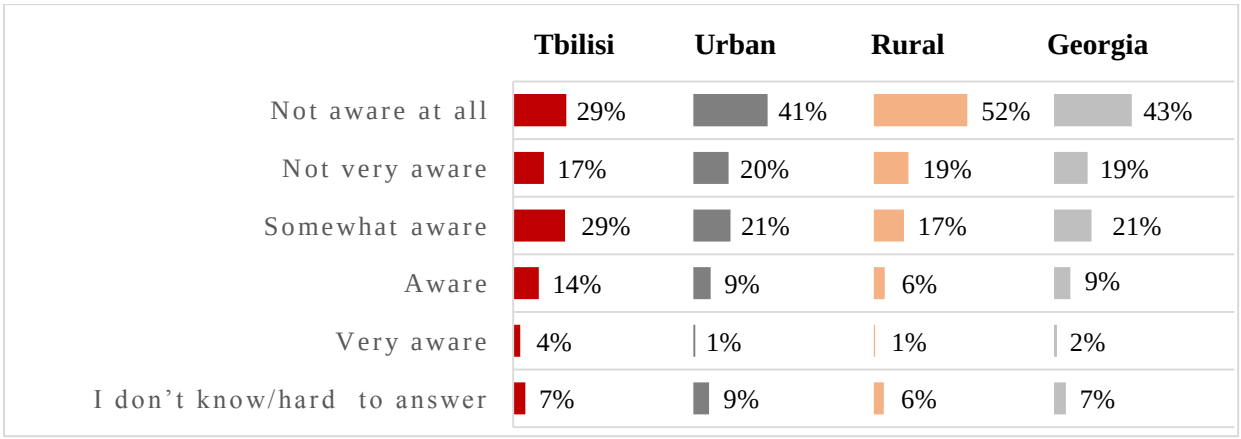
According to the survey, not many residents of Georgia are familiar with the concept of energy efficiency. There are more people in Tbilisi who consider themselves somewhat aware of the term, but those who consider themselves familiar with energy efficiency are quite few. Accordingly, respondents are not well aware of energy efficiency measures as well.

Figure 79 – Awareness of the "Energy Efficiency" Concept



Sample size = 1200

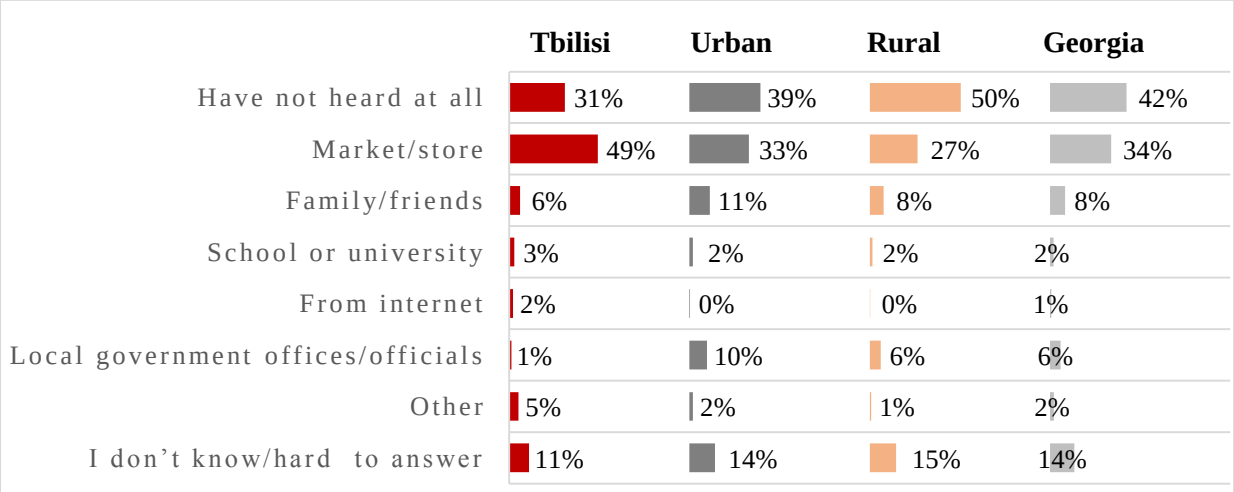
Figure 80 – Awareness that "Energy Efficiency" Measures, Technology, and Appliances can Provide Cost Savings and Increase Comfort



Sample size = 1200

Survey results show that every third respondent from Tbilisi even has not heard of the term "energy efficiency"; the share of uninformed is higher in other urban areas and especially in rural areas, where the half of the respondents report they have never heard of energy efficiency. For those who have at least minimal information on energy efficiency, the main information source is informal communication on the market/store.

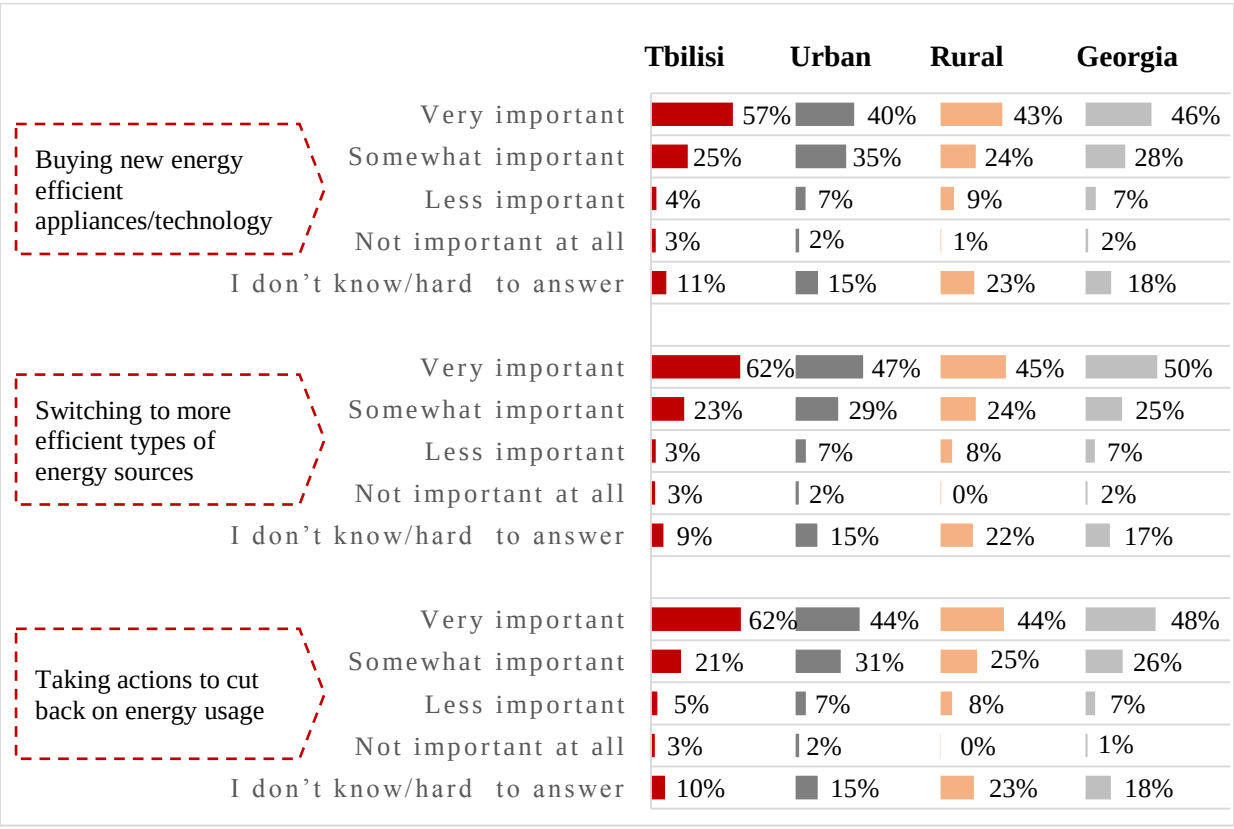
Figure 81 – Information Sources for "Energy Efficiency"



Sample size = 1200

Although the majority of respondents are not informed about energy efficiency measures, they consider buying efficient appliances and technologies, switching to efficient energy sources, and taking action to cut down energy consumption quite important.

Figure 82 – Attitudes toward Energy Efficiency Measures



Sample size = 1200

Analysis of the attitudes towards energy efficiency measures by car purchase preferences show that those who pay more attention to fuel efficiency and car condition consider energy efficiency measures more important although EE is highly evaluated by all car owners (see table below).

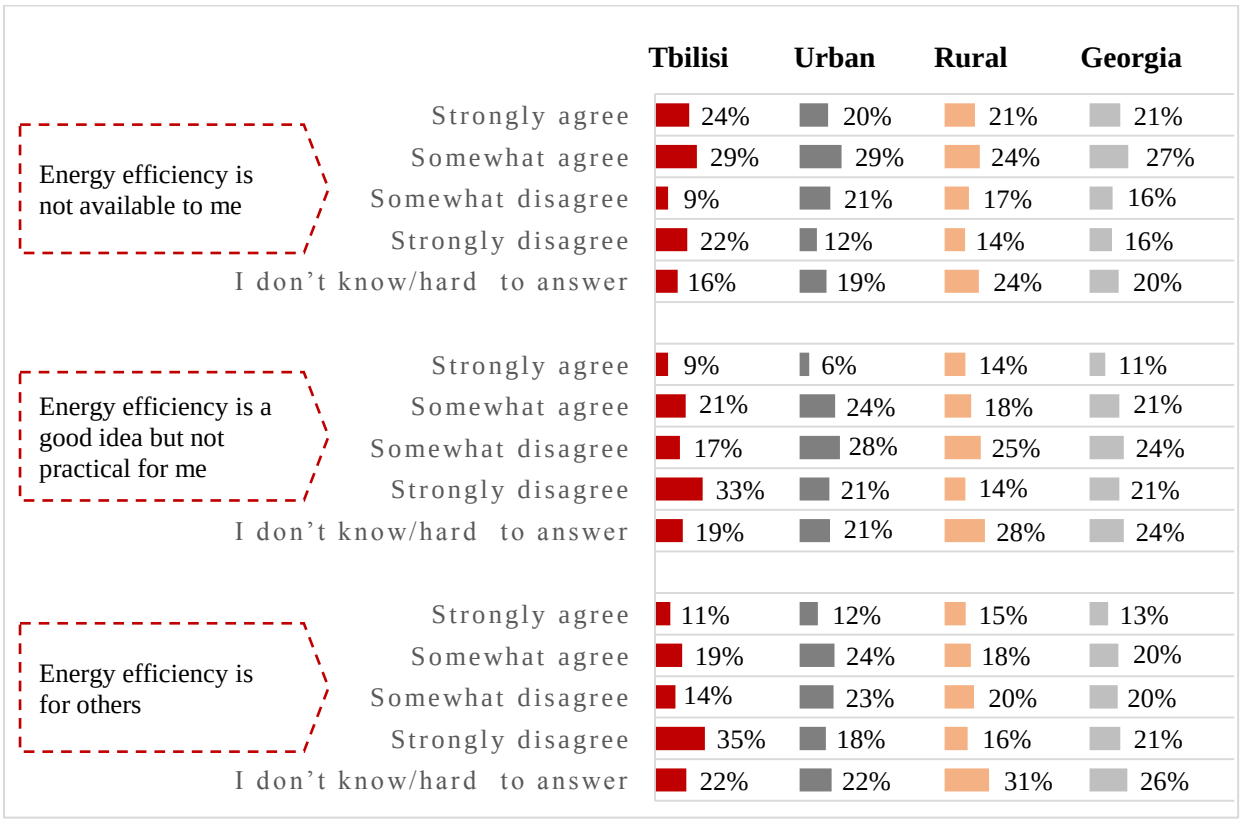
Table 39 – Attitudes toward Energy Efficiency Measures by Car Purchase Preferences

	Car Purchase Preferences					
	Price	Model	Performance	Durability	Fuel efficiency	Car condition
Buying new energy efficient appliances/technology is important	72%	80%	83%	80%	84%	87%
Switching to more efficient types of energy sources is important	77%	80%	80%	77%	87%	83%
Taking actions to cut back on energy usage is important	71%	78%	77%	79%	88%	83%

An analysis of data by different groups reveals that those who have already implemented energy efficiency measures such as switching to energy efficient home appliances, or those who have implemented any cost reduction practices such as using gas instead of petrol or diesel, tend to be more open minded to energy efficiency in general.

Considering the unfamiliarity of respondents with the term energy efficiency and it's measures, attitudes toward it vary significantly.

Figure 83 – Attitudes toward Energy Efficiency



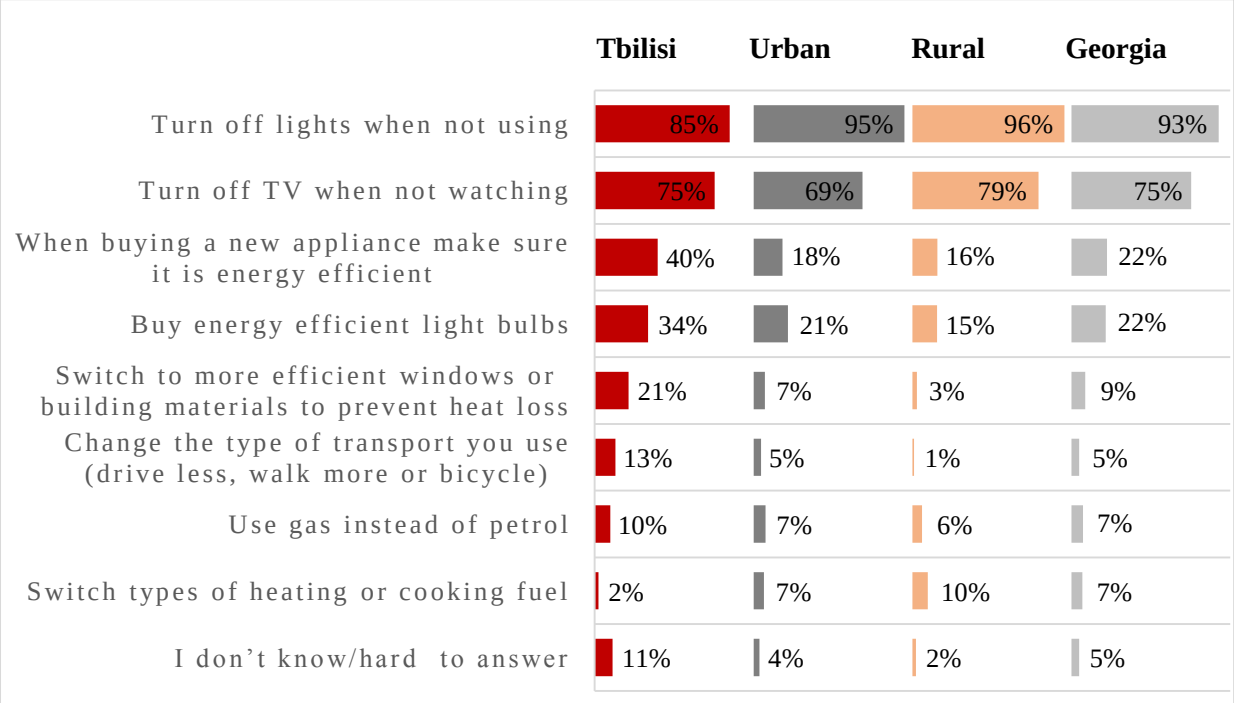
Sample size = 1200

Cross analysis of the survey data show that there is no statistically valid difference between those who do and do not use natural gas in vehicles, people with different vehicle repair and

maintenance pattern and those who take energy efficiency to improve fuel efficiency and car purchase preferences with attitudes towards and energy efficiency measures. Also, those who have purchased home appliances recently and who own old home appliances don't show significant deviation in terms of attitudes about energy efficiency.

In general, respondents don't implement major energy saving actions – an absolute majority of them only switch off light bulbs when nobody is in the room, or turn off the TV when nobody is watching. There are more people in Tbilisi who consider the energy efficiency of the appliance while purchasing a new one for the household.

Figure 84 – Energy Saving Actions



Sample size = 1200

Those who have purchased home appliances recently don't differ from others in terms of "Taking actions to cut back on energy usage"; the only difference is that those who have purchased a home appliance recently or use energy efficient light bulbs state "When buying a new appliance make sure it is energy efficient" or "Buy energy efficient light bulbs".

Analysis of the energy saving action by Age groups show that the younger generation pays more attention to the energy efficiency of the light bulbs while compared to elderly people. In general, generations dint significantly differ in term of energy efficient behavior.

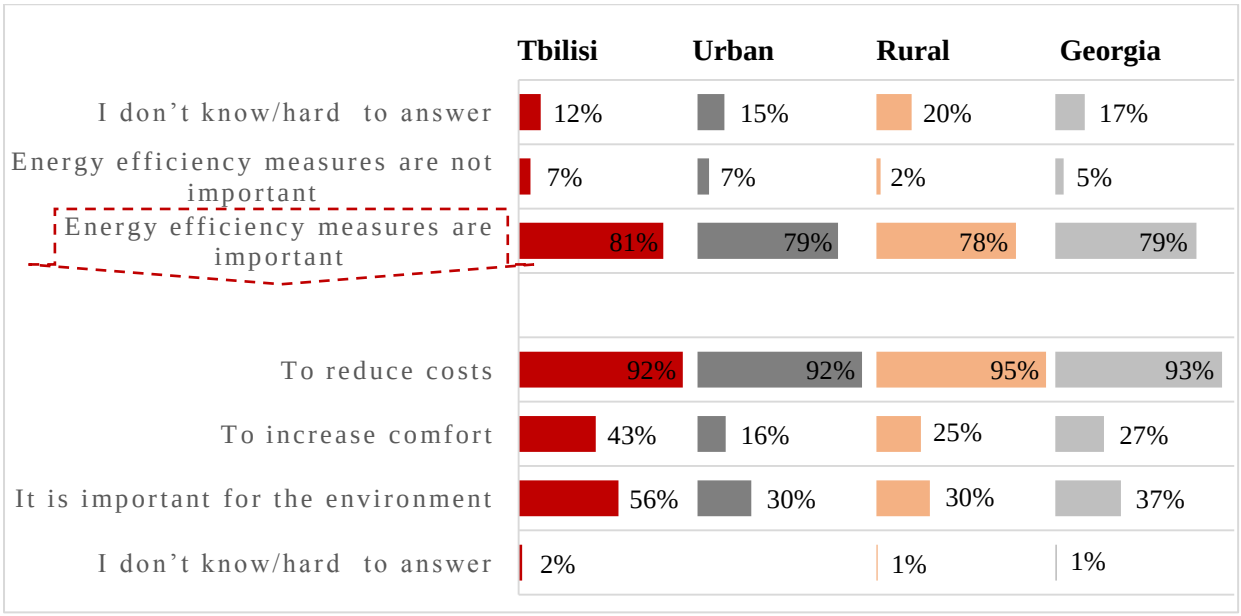
Table 40 – Undertaking Energy Saving Actions by Age Groups

Energy Saving Actions	18 - 24 years	25 - 34 years	35 - 44 years	45 - 54 years	55 - 64 years	65 + years
Turn off lights when not using	88%	95%	93%	93%	93%	91%
Turn off TV when not watching	67%	72%	77%	75%	79%	74%
When buying a new appliance make sure it is energy efficient	31%	21%	28%	27%	21%	13%
Buy energy efficient light bulbs	27%	19%	26%	23%	17%	22%
Change the type of transport you	13%	5%	6%	4%	4%	3%

use (drive less, walk more or bicycle)						
Switch to more efficient windows or building materials to prevent heat loss	9%	11%	12%	9%	6%	5%
Change fuel consumption system in the car to use less fuel	6%	3%	5%	4%	2%	2%
Switch types of heating or cooking fuel	3%	9%	8%	7%	6%	6%
Use transport fuel – gas instead of petrol	3%	5%	6%	5%	2%	3%

In general, energy efficiency measures are evaluated as important factors mainly in order to reduce costs. Also, a significant number of respondents, especially from Tbilisi, think of environmental issues when discussing energy efficiency, although this attitude is not well reflected in practice in terms of buying energy efficient home appliance.

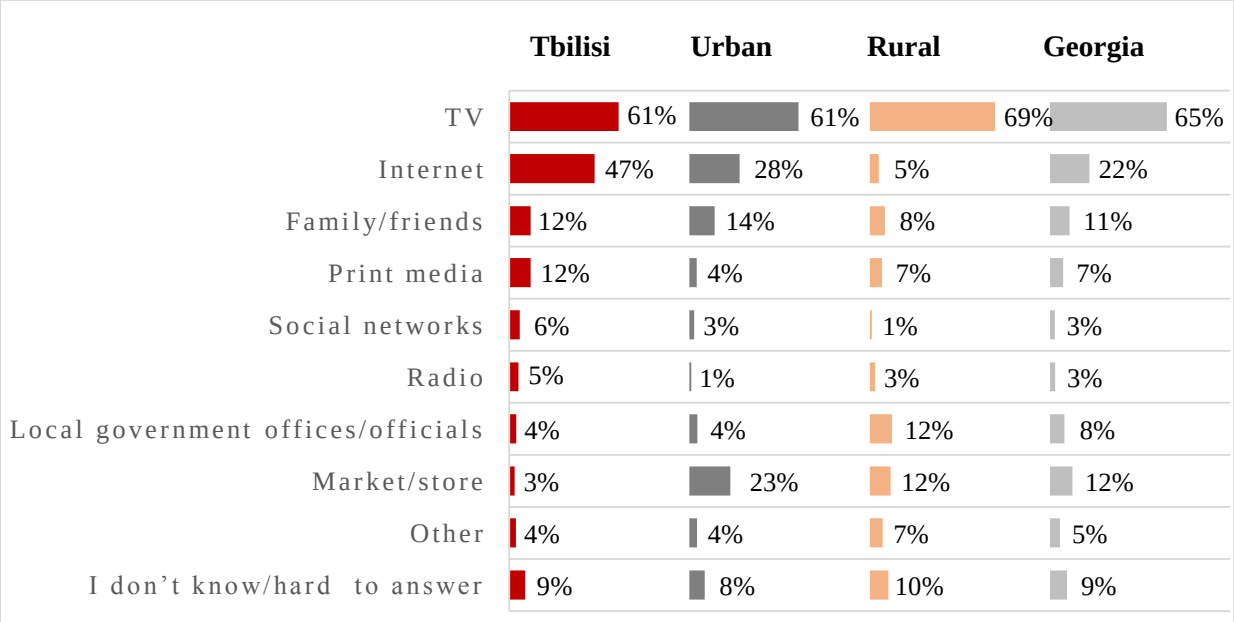
Figure 85 – Importance of Energy Saving Measures



Sample size = 1200

For information campaigns on energy efficiency, TV is the most preferred information source. Tbilisi residents and residents of other urban areas also name internet as an information source for familiarizing themselves with energy efficiency.

Figure 86 – Potential Information Sources on Energy Efficiency



Sample size = 1200

GENERAL ENERGY EFFICIENCY BY TARGET MUNICIPALITIES

Almost half of the residents in Kutaisi, Poti and Gori towns are not familiar at all with the concept and term "energy efficiency". A majority of Zestafoni urban citizens report the same, while every fifth inhabitant in Zestafoni villages reports either that they are somewhat familiar or familiar with the term "energy efficiency". Accordingly, every fourth resident in Zestafoni villages is aware or even well aware of energy efficiency measures as well.

It is noteworthy that the main source of information regarding the concept of "energy efficiency" is the market place. About one-fourth of residents in Akhaltsikhe and Zestafoni villages as well as in Rustavi town have heard about the term from the local government.

Table 41 – Awareness of Energy Efficiency and its Measures by Target Municipality

		Awareness of the term "Energy Efficiency"						Awareness of Energy efficiency measures					
Municipalities		**Not familiar at all**	**Not very familiar**	**Somewhat familiar**	**Familiar**	**Very familiar**	**I don't know**	**Not aware at all**	**Not well aware**	**Somewhat aware**	**Aware**	**Well aware**	**I don't know**
Tbilisi		29%	16%	**33%**	13%	3%	5%	28%	18%	29%	15%	4%	6%
Kutaisi		**49%**	11%	23%	12%	3%	2%	50%	10%	25%	12%	2%	2%
Batumi		32%	15%	27%	11%	2%	13%	33%	18%	25%	7%	2%	15%
Rustavi		29%	15%	32%	13%	5%	7%	25%	22%	33%	11%	3%	7%
Poti		**46%**	24%	22%	5%	1%	3%	44%	27%	22%	5%	2%	2%
Gori	Urban	**46%**	8%	29%	11%	1%	5%	45%	11%	25%	12%	1%	7%
	Rural	60%	17%	14%	6%	1%	3%	60%	18%	15%	5%	1%	2%
	TOTAL	55%	14%	19%	7%	1%	4%	55%	15%	18%	7%	1%	4%
Zugdidi	**TOTAL**	67%	12%	15%	4%	1%	2%	67%	14%	13%	3%	1%	3%
Zestafoni	Urban	**66%**	7%	12%	**12%**	3%	0.0%	65%	9%	14%	8%	4%	0.0%
	Rural	37%	18%	**20%**	**21%**	4%	0.4%	36%	18%	21%	**20%**	**4%**	2%
	TOTAL	47%	14%	17%	18%	3%	0.3%	46%	15%	18%	16%	4%	1%
Akhaltsikhe	Urban	35%	20%	18%	16%	1%	11%	35%	18%	20%	**4%**	10%	13%
	Rural	33%	34%	**24%**	2%	1%	7%	33%	35%	26%	**1%**	0%	5%
	TOTAL	34%	27%	21%	9%	1%	9%	34%	26%	23%	**3%**	5%	9%
Telavi	**TOTAL**	39%	18%	30%	9%	3%	1%	38%	20%	31%	7%	2%	1%

Sample size = 3800

Attitudes towards EE differs across municipalities, namely, more people from Kutaisi, Rustavi, Zestafoni, Akhaltsikhe share the opinion that "Energy Efficiancy" is not for them.

Table 42 – Attitudes towards EE by Target Municipality

	"Energy Efficiency in not available for me"
Tbilisi	51%
Kutaisi	**67%**
Batumi	36%
Rustavi	**64%**
Poti	55%
Gori	26%
Zugdidi	33%
Zestafoni	**65%**
Akhaltsikhe	**65%**
Telavi	42%

In general, respondents in all target municipalities do not implement major energy saving actions – an absolute majority of them only switch off light bulbs when nobody is in the room or turn off the TV when nobody is watching. There are more people in Tbilisi as well as rural areas of Zetafoni and Telavi who consider energy efficiency of the appliance while purchasing a new one for the household. Half of the urban inhabitants of Zestafoni would buy energy efficient light bulbs for energy saving.

Energy efficiency measures are generally evaluated as an important factor. However, one-third of residents in Gori town do not consider it important at all. It is noteworthy that energy efficient measures are considered as important mainly to reduce costs. Also, a majority in Tbilisi, Rustavi, Gori and Zestafoni urban areas think of environmental issues when discussing energy efficiency. Only one percent of the population in Gori villages think of environmental issues when discussing the importance of energy efficiency.

Table 43 - Energy Efficient Light Bulbs

Municipalities		Turn off lights when not using	Turn off TV when not watching	Buy energy efficient light bulbs	Buy energy efficient appliance	Change heating/ cooking fuel
Tbilisi		85%	75%	30%	**40%**	3%
Kutaisi		93%	87%	30%	30%	17%
Batumi		77%	72%	34%	18%	19%
Rustavi		93%	91%	32%	30%	12%
Poti		96%	80%	26%	15%	18%
Gori	Urban	98%	92%	16%	16%	5%
	Rural	100%	76%	3%	2%	1%
	TOTAL	99%	81%	8%	7%	3%
Zugdidi	Urban	92%	79%	21%	15%	8%
	Rural	78%	61%	11%	12%	5%
	TOTAL	83%	68%	15%	13%	6%
Zestafoni	Urban	99%	81%	**50%**	32%	36%
	Rural	94%	78%	24%	**41%**	22%
	TOTAL	96%	79%	33%	38%	27%
Akhaltsikhe	Urban	94%	77%	31%	26%	14%
	Rural	89%	76%	21%	13%	22%
	TOTAL	92%	76%	26%	20%	18%
Telavi	Urban	99%	94%	35%	38%	2%
	Rural	99%	97%	27%	**51%**	4%
	TOTAL	10%	57%	29%	1%	3%

Sample size = 3800

ANNEXES

Annex #1 – Description by Target Municipalities
Annex #2 – Survey Questionnaire
Annex #3 – Statistics by Target Municipalities in Excel Format